Council Business Meeting

October 5, 2021

Agenda Item	Rogue Valley Sewer Services – Ashland Connection Options	
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SUMMARY

Before Council is background information on options to connect the City's wastewater collections system to the Rogue Valley Sewer Services (RVSS) system and convey wastewater from Ashland to the Medford Reclamation Treatment Facility. The Council requested information on the potential connection to the RVSS during the 2021-2023 Biennium Budget process. Outlined below is background information on connection options. Carl Tappert the General Manager of RVSS will present information on connection options and answer Council questions. Dustin Hagemann Water Reclamation Division Manager will also be available to answer questions regarding impacts and requirements for wastewater treatment via the regional reclamation facility.

POLICIES, PLANS & GOALS SUPPORTED

City Council Goals:
Maintain Essential Services – Wastewater Treatment
Continue to leverage resources to develop and/or enhance Value Services

- Emergency Preparedness
- Address Climate Change

CEAP Goals:

- Reduce Ashland's contribution to global carbon pollution by reducing greenhouse gas emissions associated with City, residential, commercial, and industrial activities
- Prepare the city's communities, systems, and resources to be more resilient to climate change impacts
- Strategic Initiatives:
  Maximize conservation of water and energy

Department Goals:

- Maintain existing infrastructure to meet regulatory requirements and minimize life-cycle costs
- Deliver timely life cycle capital improvement projects
- Maintain and improve infrastructure that enhances the economic vitality of the community
- Evaluate all city infrastructure regarding planning management and financial resources

PREVIOUS COUNCIL ACTION

The Council has previously discussed a potential connection to RVSS for conveyance of wastewater to the Medford Reclamation Facility. These discussions occurred primarily in the 1990's and are part of the Council record. The discussions revolved around consideration of expansion and updating the existing wastewater treatment plant to meet regulatory permit requirements (National Pollution Discharge Elimination System NPDES) versus connection to the RVSS/Medford Reclamation system.

BACKGROUND AND ADDITIONAL INFORMATION

The Regional sewer system currently is made up of two parties - the City of Medford and Rogue Valley Sewer System (RVSS). Medford operates the regional treatment plant and most of the collection system within the Medford City limits. RVSS operates the collection systems for the cities of Eagle Point, Central Point, Jacksonville, Phoenix, Talent, White City, portions of south and west Medford, the unincorporated areas connected to the sewer, and the regional interceptor system that connects all of them to Medford's treatment plant.

The Regional Sewer System is governed by a Regional Rate Committee consisting of two representatives from the Medford City Council and two representatives from the RVSS Board of Directors. The committee sets the rates for the treatment, interceptor, and System Development Charges (SDCs) for the treatment plant. The committee must also give approval to serve any area outside of our district boundary with a flow in excess of 25,000 gallons per day.

A connection between the City of Ashland, the RVSS regional interceptor, and the wastewater treatment plant is considered feasible, although there may be some flow restrictions for peak based on the interceptor's ability to convey flow.

The connection was discussed in the 90's and early 2000's when the City of Ashland made the choice to upgrade the existing wastewater treatment facility instead of joining the region.

There are three basic elements involved with Ashland joining the Regional system: the legal structure; the financial consideration; and the actual engineering.

RVSS sees three models of a legal structure for Ashland, though there could be others that have not been developed or considered. All options would require the approval of the Regional Committee.

1. Become a full partner in the Regional system: Under this scenario Ashland would connect to the region and have a seat both on the Regional Rate Committee and the Technical Advisory Committee. Ashland would pay monthly treatment charges to the City of Medford and a monthly interceptor charge to RVSS**. Ashland would have to comply with the regional sewer use ordinance which includes the industrial pre-treatment ordinance**. The regional sewer agreement requires local municipalities to adopt and update their own sewer use codes to be no less stringent than Medford's requirements, including future code revisions. New connections within Ashland would pay the treatment SDC established by the committee. Ashland would retain full control over the collection system and set all user rates within the City.

2. Become a satellite collection system: This is virtually identical to the first option except that Ashland would not have representation on the committees.

3. Annex into RVSS: The annexation process is defined in ORS 198.866. This would require approval by the City Council and a vote of the people. A vote is not required within RVSS if the population of Ashland is less than 20% of the population within RVSS.

The annexation process is more complicated, but it could provide additional benefits. With an annexation the sewer infrastructure within Ashland would become the responsibility of RVSS. Agreements would need to be negotiated and developed covering a wide variety of topics such as billing rates, construction plan reviews, connection permits, transfer of employees and equipment, road/excavation permits, etc. If done properly the result would be that the City is free from the sewer business. With any connection method the City of Ashland would no longer fall under NDPES regulations as that requirement would transfer to the City of Medford.

The main financial consideration would be some sort of "buy-in" fee or SDC. The most extreme interpretation of this would be for Ashland to be assessed an SDC for every building connected to the sewer system. This methodology was used when Eagle Point connected to the region in 1996.

Another approach would be to assess Ashland as a single user using the Large Wet Industrial formula in the SDC resolution (Item 18). This approach was recently approved for the connection of Gold Hill to the region. Gold Hill has not made a formal determination on whether or not to connect.

The whole process would be a negotiated agreement of some sort and it is possible that some other formula for buy-in costs could be used.

The physical connection to the regional system would need to be engineered and constructed by the City of Ashland. The interceptor ends in Talent on Valley View Road and this would be the point of connection location for the City. There is potential for either a gravity sewer that roughly parallels Bear Creek or a new conveyance and lift station system.

Feasibility Study:

The City of Medford was just issued their new NPDES permit, and they are on a tight schedule to make some significant upgrades to the treatment facility. In order to meet regulatory requirements, they are currently updating the plants facilities plan. The large addition of flow from Ashland would impact the plant and future capital needs and a connection from Ashland would need to be accounted for in the facilities plan. If the City is serious about making this connection funds would need to be allocated to cover the costs associated with the additional analysis needed to ensure regulatory compliance with the additional flow projections. This would need to move forward quickly. This would also be necessary to analyze capital costs necessary for expansion and how that would translate into the "buy-in" as part of the connection process. The facility plan needs to be completed by 2023 as part of Medford's NPDES compliance schedule and the City of Ashland would need to wait until then to understand the financial, staffing, and capital impacts of joining the regional system.

In addition to supporting costs for Medford's facility plan the City should conduct its own feasibility study. High level components of a feasibility study could include:

1. Develop and recommend connection options that best meets Ashland's needs
2. Recommend connection routing
    a. Lift station route - "pumping"
    b. Gravity flow route – Bear Creek
3. Determine environmental impacts of connection
    a. Bear Creek loss of water/downstream uses
        i. Potential legal liability issues
    b. No potential for future reuse of treated wastewater
    c. GHG – construction and long-term maintenance impacts
        i. Pumping system or gravity connection to RVSS
4. Outline environmental requirements and permitting needs for construction activities
5. Wastewater Treatment Plant asset management
    a. Develop recommendation for the existing facility post connection
    b. Outline flow equalization/storage requirements for connection to interceptor if any
6. Analyze and recommend changes to collection system that support connection
7. Analyze costs and compare to existing operational costs (20 year)
    a. Develop connections costs
        i. System Development Charges/Connection Fee (SDC)

ii. Connection construction costs
iii. Rate impacts
1. Compare existing vs. proposed under connection scenarios
2. Include debt service requirements for connection scenarios
iv. SDC Impacts – COA vs. RVSS & Reclamation
1. Compare existing vs. proposed under connection scenarios
a. Single Family
b. Multi-family
c. Commercial
v. Operating and life cycle costs of connection
1. Develop operational/maintenance costs
a. City ownership of collection system
b. RVSS ownership of collection system (annexation)
vi. Future potential costs (Ashland vs. Medford)
1. Capital costs for Ashland
2. Capital cost for Medford

8. Outline fee payment structures based on connection options
    a. Management and control structure for fees/rate/SDCs
9. Schedule of activities for connection
    a. Negotiate agreement
    b. Connection design and environmental permitting
    c. Debt service needs
    d. Connection construction activities

FISCAL IMPACTS

Fiscal impacts would need to be fully evaluated in a feasibility study and presented before the Council at a future date.

A potential immediate fiscal impact would be associated with work on Medford Reclamations Facility Plan update necessary to evaluate additional system improvements necessary to accept the City of Ashland's flow.

STAFF RECOMMENDATION

N/A

ACTIONS, OPTIONS & POTENTIAL MOTIONS

Potential actions would include direction from Council on next steps if any.

1. Take no action
2. Request additional information
3. Develop and enter into an Intergovernmental Agreement with Medford to cover costs of a facility plan analysis to include Ashland's flow addition
4. Develop a Connection Feasibility Study solicitation package for Council approval

REFERENCES & ATTACHMENTS

Attachment #1: Regional Agreement Template
Attachment #2: RVSS and Medford Reclamation Fees
Attachment #3: City of Ashland Sewer Rate Resolution
Attachment #4: 1990's City of Ashland Wastewater Treatment Plant and Bear Creek Valley Sanitary Authority information
Attachment #5: Ashland Connection Options
Link: RVSS Sewer Codes

REGIONAL SEWER AGREEMENT

February, 2021

ROGUE VALLEY SEWER SERVICES

CITY OF MEDFORD

TABLE OF CONTENTS

REGIONAL SEWER AGREEMENT

This AGREEMENT is made this 18 day of Feb, 2021 between ROGUE VALLEY SEWER SERVICES hereinafter called "RVSS" and the CITY OF MEDFORD, hereinafter called "Medford".

In consideration of the mutual covenants contained herein, it is hereby agreed as follows:

SECTION I – DEFINITION OF TERMS

The following words and phrases used in this Agreement shall have the meanings hereinafter set forth in this section:

(a) "Committee" shall mean the Regional Committee described in Section IV.

(b) "Control Authority" shall mean the Party whose industrial pretreatment program has been approved by the Oregon Department of Environmental Quality in accordance with 40 CFR 403.11. Medford is the control authority for this agreement.

(c) "Customer" means any entity discharging wastewater to the Regional Water Reclamation Facility (RWRF).

(d) "Dunn Pump Station and Pressure Main" shall mean the sewage pumping facility at the northern terminus of the Lower Bear Creek interceptor on Kirtland Road east of Bear Creek and the pressure main from the pumping facility to the Upper Bear Creek Interceptor.

(e) "Excess flow" refers to any amount of flow for any 24 hour period more than three and one-half (3.5) times the average daily flow during the dry weather flow months of May, June, July, August, September, and October of that same year. The units of flow shall be measured in MGD, carried to the one-hundredth part thereof. RVSS shall identify the 24 hour period of excess flow.

(f) "Improvement" means capacity increasing capital improvements. An increase in system capacity may be established if a capital improvement increases the level of performance or service provided by existing facilities or provides new facilities.

(g) "Infiltration and Inflow" (I&I) shall mean any storm water or groundwater entering the sewage collection system.

(h) "Interceptor System" shall mean the Upper Bear Creek Interceptor, Lower Bear Creek Interceptor, North Medford Trunk, White City Trunk and Dunn Pump Station and pressure main as defined in this section.

(i) "Local Sewerage Facilities" shall mean all facilities owned, managed, or operated by a Party for the local collection of sewage to be delivered to an interceptor, to a joint-use trunk, or to the RWRF.

(j) "Lower Bear Creek Interceptor (LBCI)" shall mean the sewer trunk line leading from the Dunn Pump Station, upstream along Bear Creek to the vicinity of the conjunction of Griffin Creek and Bear Creek. From the said conjunction of Griffin Creek and Bear Creek, the Central Point section of the LBCI extends southerly to the City of Central Point at Taylor Road, and from said conjunction of Griffin Creek and Bear Creek, the Medford section of the LBCI extends upstream along Bear Creek to Medford at manhole E-94A.

(k) "Main Sewer" shall mean a sanitary sewer that will receive the flow from more than one service connection and discharge into a trunk or interceptor.

(l) "Medford" shall mean the City of Medford, a municipal corporation in the State of Oregon, County of Jackson.

(m) "MGD" means million gallons per day.

(n) "North Medford Trunk" shall mean the sewer trunk main leading from the RWRF generally along Table Rock Road and Biddle Road to a manhole at the Northwest corner of the intersection of Biddle Road and Highway 62.

(o) "Party or Parties" shall mean those entities who own local sewerage facilities served by the RWRF. Parties are also signatories to the Regional Agreement and serve on the Regional Committee and the Technical Advisory Group. .

(p) "Publicly Owned Treatment Works (POTW)" means any devices or systems used in the collection, storage, treatment, recycling, and reclamation of sewage or industrial wastes of liquid nature and any conveyances which convey wastewater to a treatment plant.

(q) "Region" shall mean all the area served by the Regional Water Reclamation Facility within RVSS's and Medford's service areas.

(r) "RVSS" means Rogue Valley Sewer Services, a Sanitary Authority formed pursuant to ORS Chapter 450.705 to 450.980

(s) "RWRF", "Sewage Treatment Plant", "the Plant" or "STP" shall mean the existing Regional Water Reclamation Facility located at 1100 Kirtland Road, Central Point, Oregon, and all facilities required to treat and dispose of Regional wastewater and wastewater products.

(t) "System" shall mean the same as Local Sewerage Facilities as defined herein.

(u) "System Development Charge" (SDCs) are those charges established and levied pursuant to this agreement for development that increases the load upon the RWRF, and the Interceptor System.

(v) "TAG" shall mean the Technical Advisory Group described in Section IV.

(w) "Trunk Sewer" shall mean a major sanitary sewer into which two or more mains discharge and which transports the flow collected from mains to an interceptor, pumping station, or the RWRF.

(x) "Upper Bear Creek Interceptor" (UBCI) shall mean the sewer trunk line leading from the RWRF to Medford on an alignment basically parallel to the North Medford Trunk line (along and near Biddle and Table Rock Roads), and continuing upstream along Bear Creek to Valley View Road, in the City of Talent, as now constructed.

(y) "User" means any person who contributes, or causes, or allows the contribution of wastewater into the POTW, including persons who contribute such wastes from mobile sources.

(z) "Wastewater" means liquid and water carried industrial wastes and sewage from residential dwellings, commercial buildings, industrial manufacturing facilities, and institutions, whether treated or untreated, which are contributed to the POTW.

(aa) "White City Trunk" shall mean the sewer trunk line leading from the RWRF east along Kirtland Road serving the White City and Eagle Point areas.

(bb) "WRD" shall mean the Medford Public Works Department Water Reclamation Division.

(cc) "WRD Manager" means the manager of the RWRF or duly designated representative with authority to administer the industrial pretreatment program and respond to the requirements of regulatory agencies with respect to the National Pollutant Discharge Elimination System (NPDES) permit held by Medford.

SECTION II – PURPOSE OF THIS AGREEMENT

The purpose of this agreement is to provide for the operation, maintenance, and improvement of the Regional Water Reclamation Facility and the Interceptor System. This agreement is authorized by ORS 190.003 to 190.030.

SECTION III – DIVISION OF RESPONSIBILITY

The Regional Water Reclamation Facility and Interceptor System shall be operated, maintained, and improved in accordance with the terms of this Agreement.

A. MEDFORD

1. Operation and Maintenance of the RWRF

Medford shall have responsibility for operating and maintaining the RWRF to serve the area within the Region.

2. Operation and Maintenance of the Collection System

Medford owns and operates the Sanitary Sewer Collection System within the service area of Medford. Medford will maintain a map of its service area and make it available upon request.

3. Improvement of the RWRF

The RWRF shall be improved in timely increments to meet the needs of the Parties. "Need" for RWRF improvement shall be deemed to exist when, from statistical information accumulated and maintained at the RWRF, Medford determines that projected use of the RWRF three years from the date of projection will exceed the RWRF design capacity, or when RWRF process unit upgrades or additions are needed to meet one or more of the standards established by the Oregon Department of Environmental Quality (DEQ), except for an operating upset or other temporary condition. Component parts of the RWRF shall be replaced when they become worn out or obsolete.

At such time as there is a need for RWRF improvement, as herein defined, Medford shall, upon its own initiative, proceed to develop engineering and financing plans for an appropriate increment or increments of such Improvement. An "appropriate increment" means facilities having capacity to serve the needs of the Region for a reasonable time in the future.

As operator of the RWRF, Medford shall give written notice by mail to all Parties of its determination of need and improvements needed and estimated cost thereof. Such notice shall be received by all Parties at least two weeks prior to a Regular or Special Meeting of the Regional Committee in which the topic is discussed. Medford's determination of need shall be conclusive upon the Parties unless overruled by a majority vote of the Committee within sixty (60) days after notice is mailed to all Parties.

4. Establish, Manage, and Report on Funds

(a) Sewage Treatment Trust Fund. Medford shall establish a fund known as the Sewage Treatment Trust Fund ("ST-Trust Fund" herein) into which all sewer treatment charges established by the Committee shall be deposited. Medford shall not less than quarterly provide to the Committee at its regular meeting a summary of beginning fund balance, operation and maintenance expenditures, capital improvement program expenditures, and the ending fund balance for the ST-Trust Fund for the previous three months and for the fiscal year to date. In the event the Committee fails to meet at least quarterly, the report shall be mailed quarterly to the respective Parties.

Medford may prudently invest all or part of the ST-Trust Fund in a separate account or co-mingle such investment with any other investment account of Medford; provided that, if co-mingled, the moneys of the ST-Trust Fund shall be accounted for separately.

Funds may be disbursed from the ST-Trust Fund in amounts necessary to, in the order of priority:

(1) Operate and maintain the RWRF and perform related support activities, including but not limited to:
   i. Management, supervision, and legal counsel;
   ii. Collecting, investing, disbursing, accounting, and reporting on funds, and;
   iii. Compiling data and providing technical studies and reports for the Committee.

(2) Pay principal and interest on any indebtedness incurred for RWRF improvements.
(3) Pay for RWRF improvements as needed.
(4) Transfer all or part of the remaining funds, if any, not needed for the purposes set forth in (1), (2), and (3) above to an RWRF capital reserve account.

(b) Sewage Treatment SDC Fund. Medford shall establish a fund known as the Sewage Treatment SDC Fund ("ST-SDC Fund" herein) into which all Sewage Treatment System Development Charges shall be deposited. Medford shall not less than quarterly provide to the Committee at its regular meeting a summary of beginning fund balance, revenues, operation and maintenance expenditures, capital improvement program expenditures, and the ending fund balance for the ST-SDC Fund for the previous three months and for the fiscal year to date. In the event the Committee fails to meet at least quarterly, the report shall be mailed quarterly to the respective Parties.

Medford is authorized to invest all or part of the ST-SDC Fund as it is the ST-Trust Fund.

Funds may be disbursed from the ST-SDC Fund in amounts necessary to:

(1) Pay for engineering studies, plans, and specifications for RWRF capacity increases;
(2) Pay for construction costs for RWRF capacity increases;
(3) Pay principal and interest on bonded indebtedness incurred for RWRF capacity increases;
(4) Pay costs of staff support for developing and implementing financing plans and construction plans for RWRF capacity increases;
(5) Pay into a reimbursement account for capital replacement of all or portions of existing unused RWRF capacity, and;
(6) Pay into a reserve account for future construction of RWRF capacity increases.

5. Medford Lands

The lands presently being used for the RWRF are county tax lot numbers 362W14-800, 166 acres, and 362W14-100, 3 acres, located north of Kirtland Road and south of the Rogue River as of the execution date of this Agreement.

Medford agrees that this land is a part of the regional treatment system, and therefore, Medford will continue to furnish the land without charge to or reimbursement from the other Parties during the life of this

Agreement, provided that if not used for treatment purposes, this land reverts solely to Medford's possession with no consideration to other Parties.

6. Technical Support

Secretarial assistance for the Committee shall be the responsibility of and provided by Medford with involvement as appropriate with other Parties' staff. The cost of staff support to the Committee by Medford shall be paid from funds budgeted in the ST-Trust Fund.

7. Measurement of Sewage Strength

Whenever the schedule of charges adopted by the Committee requires measurements of the strength of sewage, such measurements shall be made by the RWRF staff.

B. ROGUE VALLEY SEWER SERVICES

1. Operation and Maintenance of the Interceptor System

RVSS shall have the responsibility of operating and maintaining the Interceptor System to serve the area within the Region.

2. Operation and Maintenance of the Collection System

RVSS owns and operates the Sanitary Sewer Collection System for the Cities of Central Point, Eagle Point, Jacksonville, Phoenix, Talent, portions of Medford, and unincorporated areas of Jackson County including White City. Areas operated by RVSS have been annexed into RVSS for the purpose of operation and maintenance of the Sanitary Sewer Collection System. RVSS will maintain a map of its service area and make it available upon request.

3. Improvement of the Interceptor System

The Interceptor System shall be improved in timely increments to meet the needs of the Parties. "Need" for Interceptor System improvement shall be deemed to exist when, from statistical information accumulated and maintained by RVSS, RVSS determines that projected use of the Interceptor System three years from the date of projection will exceed design capacity, or when Interceptor System upgrades or additions are needed to meet one or more of the standards established by the Oregon Department of Environmental Quality (DEQ), except for temporary conditions. Component parts of the Interceptor System shall be replaced when they become worn out or obsolete.

At such time as there is need for Interceptor System improvement, as herein defined, RVSS shall, upon its own initiative, proceed to develop engineering and financing plans for an appropriate increment or increments of such improvement. An "appropriate increment" means facilities having capacity to serve the needs of the Region for a reasonable time in the future.

As operator of the Interceptor System, RVSS shall give written notice by mail to all Parties of its determination of need and improvements needed and estimated cost thereof. Such notice shall be received by all Parties at least two weeks prior to a Regular or Special Meeting of the Regional Committee in which the topic is discussed. RVSS's determination of need shall be conclusive upon the Parties unless overruled by a majority vote of the Committee within sixty (60) days after notice is mailed to all Parties.

4. Establish, Manage, and Report on Funds

(a) Interceptor System Operations & Maintenance Fund (excluding Dunn Pump Station). RVSS shall establish a fund known as the Interceptor system Operations and Maintenance Fund ("IS-O&M Fund" herein) into which all IS-O&M charges established by the Committee shall be deposited for the operation and maintenance of the Interceptor System. Reference to Interceptor System in this subsection excludes Dunn Pump Station and Pressure Main. RVSS shall provide not less than quarterly to the Committee at its regular meeting a summary of beginning fund balance, revenues, operation and maintenance expenditures, capital improvement program expenditures, and the ending fund balance for the IS-O&M Fund for the previous three months and for the fiscal year to date. In the event the Committee fails to meet at least quarterly, the report shall be mailed quarterly to the respective Parties.

RVSS may prudently invest all or part of the IS-O&M Fund in a separate account or co-mingle the Fund with any other investment account of RVSS; provided that, if co-mingled, the moneys in the IS-O&M Fund shall be accounted for separately.

Funds may be disbursed from the IS-O&M Fund in amounts necessary to, in the order of priority:

(1) Operate and maintain the Interceptor System and perform related support activities, including but not limited to:
   i. Management, supervision, and legal counsel;
   ii. Collecting, investing, disbursing, accounting, and reporting on funds, and;
   iii. Compiling data and providing technical studies and reports for the Committee.

(2) Pay principal and interest on any indebtedness incurred for Interceptor System improvements.

(3) Pay for Interceptor System improvements as needed.

(4) Transfer all or part of the remaining funds, if any, not needed for the purposes set forth in (1), (2), and (3) above to an Interceptor System capital reserve account.

(b) Interceptor Capital Expansion Fund. RVSS shall establish a fund known as the Interceptor System Capital Expansion Fund ("ICE Fund" herein) into which all Interceptor System Fees and System Development Charges shall be deposited. RVSS shall not less than quarterly provide to the Committee at its regular meeting a summary of beginning fund balance, revenues, capital improvement program expenditures, and the ending fund balance for the ICE Fund for the previous three months and for the fiscal year to date. In the event the Committee fails to meet at least quarterly, the report shall be mailed quarterly to the respective Parties.

RVSS is authorized to invest all or part of the ICE Fund as it is the IS-O&M Fund.

Funds may be disbursed from the ICE Fund in amounts necessary to:

(1) Pay for engineering studies, plans, and specifications for Interceptor System improvements;

(2) Pay for construction costs for Interceptor System improvements;

(3) Pay principal and interest on bonded indebtedness incurred for Interceptor System Improvements;

(4) Pay costs of staff support for developing and implementing financing plans and construction plans for Interceptor System improvements;

(5) Pay into a reimbursement account for capital replacement of all or portions of existing unused Interceptor System capacity, and;

(6) Pay into a reserve account for future construction of Interceptor System improvements.

(c) Dunn Pump Station Operations and Maintenance Fund. RVSS shall establish a fund known as the Dunn Pump Station Operation and Maintenance Fund ("DPS-O&M Fund" herein) into which shall be deposited the respective shares of the Parties paid to defray the cost of operating and maintaining the

Dunn Pump Station and Pressure Main. RVSS shall not less than quarterly provide to the Committee at its regular meeting a summary of beginning fund balance, revenues, expenditures, and the ending fund balance for the DPS-O&M Fund for the previous three months and for the fiscal year to date. In the event the Committee fails to meet at least quarterly, the report shall be mailed quarterly to the respective Parties.

RVSS may prudently invest all or part of the DPS-O&M Fund in a separate account or co-mingled with any other investment account of RVSS; provided that, if co-mingled, the moneys in the DPS-O&M Fund shall be accounted for separately.

Funds may be disbursed from the DPS-O&M Fund in amounts necessary to:

(1) Pay the cost of operating and maintaining the Dunn Pump Station and Pressure Main, and;
(2) Pay into and maintain a reasonable reserve to ensure adequate funds at all times for operation and maintenance of the Dunn Pump Station and Pressure Main.

C. ALL PARTIES

1. Monthly Statement of Customers and Flow

All Parties shall each month file with all Parties a statement disclosing the total number of customers and sewage flow in each classification within its jurisdiction as of the date thereof. The Committee shall have the right to review and correct errors in the statements of customers and flow filed by any Party.

2. Payment of the Base Rate (Section IV, F, 1) to Medford

To meet the obligations paid out of the ST-Trust Fund, all Parties shall collect and pay monthly to Medford the sewage treatment charge base rate established by the Committee for each customer by classification within the Party's respective jurisdiction. Changes in extra strength charges shall be effective for the month next following the month in which Medford gives notice to the Parties of the change.

3. Payment of the Cost of Operation and Maintenance of the Interceptor System

Each Party shall collect and pay monthly to RVSS the Interceptor Operations and Maintenance base rate established by the Committee for each customer by classification.

4. Payment of Sewage Treatment Systems Development Charges to Medford

Each Party that controls sewer connections and the issuance of sewer permits shall collect, or cause to be collected, the applicable Sewage Treatment Systems Development Charges ("ST-SDC" herein) and remit them to Medford. Each Party shall keep, or cause to be kept, records of all building permits and sewer connection permits, which shall be subject to review by the Committee at any time. The time and method of collection of the ST-SDC is the responsibility of each Party within its jurisdiction. However, each Party shall pay the ST-SDC to Medford not later than thirty (30) days after permits have been issued or at such other time as is determined by the Committee, regardless of whether the Party has collected the ST-SDC from the owner or not.

5. Payment of Interceptor SDCs and/or Interceptor Capital Expansion Fees to RVSS

Each Party that controls sewer connections and the issuance of sewer permits shall collect, or cause to be collected, the applicable Interceptor System Development Charges ("I-SDC" herein) and remit them to RVSS. Each Party shall keep, or cause to be kept, records of all building permits and sewer connection permits, which shall be subject to review by the Committee at any time. The time and method of collection of the I-SDC is the responsibility of each Party within its jurisdiction. However, each Party shall pay the I-SDC to RVSS not later than thirty (30) days after permits have been issued or at such other time as is determined by the Committee regardless of whether the Party has collected the I-SDC from the owner or not.

Each Party shall collect and pay monthly to RVSS the Interceptor Capital Expansion Fee established by the Committee for each customer by classification.

6. Identification and Prevention of Excessive Flows

Each Party agrees to take all reasonable measures to prevent and reduce excessive flows within its jurisdiction during the life of this Agreement. Excessive flows will be identified using data from permanent flow meters installed in the interceptor system. These data will be used to compare wet weather to dry weather flow ratios during the calendar year. Excessive flows are the portion of flow above the ratio determined in Section I, (e). Presentation of identified excess flows occurring from a preceding calendar year shall be made by RVSS at an annual TAG meeting scheduled prior to the February Committee meeting.

(a) Flow measurement shall be made following a standard engineering practice;
(b) If excessive flows as defined herein are verified, the Party having the excessive flow shall pay an additional treatment charge as determined by the Committee;
(c) A detailed report and schedule for reduction of verified excess flows shall be required to meet State and Federal National Pollutant Discharge Elimination System (NPDES) permits.
    (1) A report identifying the source or sources of excess flows and a schedule to reduce said flows shall be submitted to the TAG within nine (9) months of the annual TAG meeting presentation;
    (2) The TAG will present the findings of the report to the Committee at the next regularly scheduled Committee meeting. Acceptance of the report and schedule by the Committee will be binding on the Party.

7. Rights of Way, Easements, and Conflicting Utilities

(a) Public Rights of Way. RVSS shall provide plans and give Medford at least sixty (60) days' notice prior to its intention to construct a regional sewage facility on a public street or road, owned by Medford, and such notice shall indicate the location and right of way requirements for installation. Medford agrees that the required right of way, within the street or road, as the case may be, will be made available for the installation without cost; provided, however, that RVSS shall be responsible for the repairs of all damaged facilities and the restoration of the area to the condition existing prior to construction in accordance with the standards and requirements of Medford.
(b) Publicly Owned Utilities. RVSS or Medford shall give each other at least sixty (60) days prior notice of any public improvement project that creates a conflict between the POTW and publicly owned utilities or street improvements. If Medford proposes to construct public improvements that require the relocation of an existing regional sewage facility, Medford will be responsible for all costs associated with this relocation. If RVSS proposes to construct a regional sewage facility that requires the relocation of any public improvements owned by the City of Medford, RVSS will be responsible for all costs associated with the relocation.
(c) Relocation of Privately Owned Facilities. RVSS will give Medford sixty (60) days prior notice of any conflicts between existing or proposed regional sewer facilities and any privately owned utility occupying a public street or road under the terms of a franchise or permit. If Medford has power to require relocation of the utility without compensation under the terms of the franchise or permit, it shall do so. If not, RVSS shall reimburse the utility for the expense of relocation.
(d) Unknown Utility Conflicts. In the event that conflicts in utility location are discovered in the course of construction, although not indicated on the construction plans, such utilities may be relocated under the circumstances and on the terms and conditions herein above set forth.

8. Industrial Pretreatment Program

The Parties shall adopt and enforce ordinances compelling and regulating the use of their respective sewage collection and treatment systems for the purpose of preserving a high standard of reliability, the reduction of maintenance costs, and enhancing efficiency in the operation of the common interceptors and the RWRF.

Medford will act as the Control Authority and must implement and enforce an industrial pretreatment program to control discharges from all industrial users of the POTW pursuant to requirements set out in 40 CFR 403, OAR 340-045-0063, and Medford's NPDES permit. The Parties agree to adopt a uniform sewer use ordinance ("SUO" herein) that subjects industrial users of the POTW to the necessary pretreatment controls, and Medford is authorized to implement and enforce that SUO.

(a) Sewer Use Ordinance and Local Limits

(1) The Parties have adopted a local SUO which is no less stringent and is as broad in scope as Medford's SUO.

(2) Whenever Medford revises its SUO, it will forward a copy of the revisions to the Parties. The Parties will adopt revisions to their SUO that are at least as stringent as those adopted by Medford. The Parties will forward to Medford for review their proposed revisions within sixty (60) days of receipt of Medford's revisions. The Parties will adopt their revisions within sixty (60) days of receiving approval from Medford of the content thereof.

(3) Medford will adopt and enforce technically based local limits in accordance with the requirements of Medford's NPDES permit.

(b) Pretreatment Program Authority and Implementation

(1) The Parties designate Medford as the agent of the Parties for the purposes of implementation and enforcement the Party's SUO against industrial users located in the Party's jurisdiction. Medford may take any action under the Party's SUO that could have been taken by the Party, including enforcement of the ordinance in courts of law.

(2) Medford, on behalf of and as agent for the Parties, will perform technical and administrative duties necessary to implement and enforce the Party's SUO. Medford will:

i. Update the industrial waste survey;
ii. Issue permits to all industrial users required to obtain a permit;
iii. Conduct inspections, sampling, and analysis;
iv. Take all appropriate action as outlined in Medford's enforcement response plan and provided for in each Party's SUO, and;
v. Perform any other technical or administrative duties the Parties deem appropriate.

(3) Medford may, as agent of the Parties, take emergency action to stop or prevent any discharge which presents or may present an imminent danger to the health or welfare of humans; which reasonably appears to threaten the environment; or which threatens to cause interference, pass through, or sludge contamination at the RWRF.

(4) The Parties agree to provide Medford with any information necessary for implementation and enforcement of the Party's SUO against industrial users located in the Party's jurisdiction. Medford may specify the format of such information and a reasonable timeframe for responding to any such request.

(c) Pretreatment Program Costs

Medford will be responsible for all costs incurred by it in implementing and enforcing the Party's SUO.

9. Operating Liability

Each Party shall be solely responsible for claims arising from its own activities hereunder, and shall save all other Parties harmless from any claim of any third party arising from such Party's act or omission.

10. Technical Data and Reports

All technical data, studies, and reports relating to the operation and maintenance of the Regional facilities shall be provided by Medford and RVSS to the Committee upon request. The Parties agree to provide information as requested to properly compile information for the Committee in such areas as treatment charges and Sewage Treatment Systems Development Charge funding levels.

SECTION IV – REGIONAL COMMITTEE

A. FORMATION

The Parties shall appoint a Regional Committee ("Committee" herein). The Committee shall be composed of two (2) representatives and such alternates appointed by the governing body of each Party. Representatives and alternates shall be members of the governing body of the Party making the appointments. Each Party shall furnish the Committee with a certified copy of the resolution of appointment of the representative and alternate. The alternate(s) may vote in the absence of the representative.

At the first meeting of each calendar year, the Committee shall elect a Chair and Vice Chair from its member representatives. The Chair and Vice Chair shall serve until their respective successors are elected or unless they are replaced as hereinafter provided. The Vice Chair shall serve in the absence of the Chair.

B. TENURE

A representative and an alternate shall serve until replaced by the appointing Parties, death, or resignation. The representative and alternate serve at the pleasure of the appointing Parties and may be replaced by the appointing Party at any time for any reason determined sufficient by the appointing party.

C. QUORUM AND VOTING

Each representative (or alternate) is entitled to one (1) vote and may vote only in person. The Presiding member may vote on all issues. A quorum shall consist of a majority of the voting membership of the Committee.

D. MEETINGS

1. Regular Meetings

The Committee shall establish a time and place for holding regular meetings of the Committee. Regular meetings of the Committee shall be held not less often than quarterly.

2. Special Meetings

Special meetings of the Committee may be held at the call of the Chair or a majority of the Committee.

3. Notice

Reminder notice of regular meetings of the Committee shall be given in writing to each representative and alternate not less than seven (7) or more than fourteen (14) days before the meeting. Notice of special meetings shall be given in writing to each representative and alternate not less than seven (7) days before the meeting. All meeting notices shall include an agenda. If given by mail, notice shall be effective on the date of mailing.

E. TECHNICAL ADVISORY GROUP

The Technical Advisory Group ("TAG" herein) is hereby formed to make recommendations to the Committee on the following matters:

(a) Technical information;
(b) Rates;
(c) System development charges, and;
(d) Other matters requested by the Committee.

The TAG shall be comprised of the managers and administrators, or other representatives, of the Parties. The governing body of each Party shall appoint in writing one (1) representative and may also appoint an alternate who is knowledgeable in technical and administrative matters as related to the regional sewer system. Each representative is entitled to one vote and the alternate may vote in the absence of the representative.

The TAG will develop written administrative guidelines for approval by the Committee to be used by the TAG in addressing technical issues brought before the TAG on the following matters:

(a) SDC category definition changes to clarify or refine application of SDCs for non-routine connections, and;
(b) Standardizing methodologies used by each Party in applying SDCs including calculations and units of assessment.

F. POWERS OF THE COMMITTEE

All decisions of the Committee pursuant to the terms of this Agreement shall be final and binding on all Parties. Each Party shall ensure that its representative carries out the duties and responsibilities prescribed by this Agreement. Each Party shall have authority within its sole discretion to increase its sewer service charge over and above the charges set by the Committee to meet each Party's requirements for Local Sewerage Facilities.

1. Establishment of User Classifications and Uniform Treatment Charges

The Committee and only the Committee shall establish user classifications and uniform charges applicable to such classifications for the area served by the Parties. In classifying customers of the Parties, the Committee shall take into consideration such factors as volume of sewage flow and the strength of sewage measured in (1) Biochemical Oxygen Demand (BOD) and (2) Total Suspended Solids (TSS).

The Committee shall set the base rate in such an amount to produce adequate funds with which to meet the obligations specified in Section III,A,3(a) above.

2. Establishment of Party's Interceptor Base Rate

The Committee and only the Committee shall establish and adjust each Party's composite Interceptor Base Rate (IBR) in such an amount to produce adequate funds with which to meet the obligations specified in Section III,B,3(a) & (c). Flows shall be measured by RVSS. The IBR shall be calculated separately for each Party using the following formula:

$$\text{Party IBR} = \frac{(\%\text{Interceptor Flow contributed by Party} \times \text{Projected Interceptor O\&M Costs}) + (\%\text{DPS Flow contributed by Party} \times \text{Projected DPS O\&M Costs})}{\text{Total \# of EDUs on interceptor}}$$

Once established, this rate shall stay the same for each Party until adjusted by the Regional Committee.

3. Establish the Amount of Sewage Treatment SDCs

The Sewage Treatment System Development Charges (ST-SDC) initiated in 1980 shall be continued in order to help generate funds to be applied upon the cost of improvement of the RWRF.

(a) The amount of the ST-SDC shall be set by the Committee and only the Committee in accordance with ORS 223.297 - 223.314.

(b) Buildings for which building permits were issued or which were occupied prior to January 6, 1980, and which obtained a sewer permit prior to January 1, 1990 will be granted SDC credit based on the use of the building at the time a sewer permit was obtained. The TAG will review available records and determine what amount of SDC is applicable for BOD, TSS, and Flow.

(c) The Party responsible for issuing building permits shall be responsible for collecting and paying to Medford the ST-SDC as required by Section III,C,4.

4. Establish the Amount of the Interceptor Capital Expansion Fee

The uniform Interceptor Capital Expansion Feed (ICE), initiated in 1999, shall be continued in order to help generate funds to be applied upon the cost of improvement of the Interceptor System. The amount of the ICE shall be set by the Committee and only the Committee, based upon the projects contained in an approved Interceptor System Facilities Plan, and reviewed at least annually between January 1 and June 1. RVSS will report annually to the Committee substantial changes to the Facility Plan. The Committee may implement an Interceptor SDC (I-SDC) in accordance with ORS 223.297 -223.314

5. Determine Excess Flow Charges

The Committee shall determine the amount of additional treatment charges or the amount to be contributed by a Party having excess flows to reduce such excessive flow in lieu of an additional treatment charge as provided in Section III, C, 6(b).

6. Approval of Connection of Additional Parties to the Regional System – Establishment of Charges

No new entity shall become a Party without the express written consent of all existing Parties. No Party shall serve additional area outside the Region with an estimated wastewater flow of greater than 25,000 gallons per day, in the aggregate over a 12-month period without approval by the Regional Committee. In approving such service, the Regional Committee shall establish conditions including but not limited to, buy-in charges, Systems Development Charges or other charges or conditions deemed reasonable. All connections shall pay appropriate SDCs to the Region.

7. Allocation of Plant Capacity

If the Parties are unable to cause the Plant to be expanded to meet anticipated needs, the Committee shall apportion the remaining treatment capacity based on the total treatment charges ("base rate" charges) paid by each Party in relation to the total of such charges paid by all Parties during the fiscal year next preceding the apportionment. The Committee may, for similar reasons, allocate interceptor capacity among Parties in proportion to their contributions to the cost of operation and maintenance of the affected facility in the prior fiscal year.

8. Conflict Resolution and Appeals- User Classifications, User Fees, or Systems Development Charges

Any user has the right to a hearing before the Committee if it objects to the user classifications or to the treatment charges. The uniform treatment charges so established shall constitute an irreducible portion of the sewer service charges which each Party shall be responsible to contribute for each customer connected to and using the Sewage Treatment Plant. The uniform rate charge shall be referred to herein as the "base rate".

Any user may appeal to the Committee if they object to the accuracy of any determination of strength of their sewage. Any Party may appeal to the Committee any such determination as to any user in the Region. The Committee shall hear the appeal and render a decision with ninety (90) days after receiving notice. Any resulting change in sewer billing shall be retroactive as far back as the beginning of the fiscal year in which the appeal was filed. The Committee shall have jurisdiction to consider appeals of persons within the Region upon whom a Systems Development Charge is proposed under the color of the Agreement. Appeal may be taken by any person upon whom a Systems Development Charge is proposed or by the Party that proposes to charge by requesting a hearing before the Committee in writing, setting forth the specific objection to or reason for the Charge. The Committee shall hear the matter within thirty (30) days of the receipt of the request. The determination of the matter by the Committee shall be binding on all interested parties.

SECTION V – EFFECTIVE DATE AND TERM OF CONTRACT

This Agreement shall be effective from the date of execution hereof by the Parties and shall continue in full force and effect for twenty (20) years thereafter.

This Agreement supersedes the Agreement of September 2004, and any Supplemental Agreements.

SECTION VI – REMEDIES

In addition to other remedies provided by law or equity, a court of competent jurisdiction may require specific performance of this agreement. Prior to exercising any other legal remedies, the Parties agree to mediate any disputes, with the Parties equally sharing the cost of mediation.

SECTION VII – SAVINGS CLAUSE

Should any part of this contract be held by a court of competent jurisdiction to be illegal or unenforceable, such event shall not be determined to affect the validity of any other portions hereof.

IN WITNESS WHEREOF, the parties have hereto caused their names to be hereunto subscribed and their seals hereto affixed.

ROGUE VALLEY SEWER SERVICES

COUNTERSIGNED: [signature]
Carl Tappert, Manager

By: Kay Harrison
Kay Harrison, Chair

CITY OF MEDFORD

ATTEST: Winnie Shepard

By: [signature] Mayor Randy Sparacino

RESOLUTION NO. 40

A RESOLUTION OF THE REGIONAL COMMITTEE approving a new rate schedule for the sewage treatment plant.

BE IT RESOLVED BY THE REGIONAL COMMITTEE that:

I

The Regional Committee has determined that the following uniform rates and user classifications are necessary and proper in order to provide adequate revenue to operate and maintain the Regional Water Reclamation Facility, pay staff support costs and meet debt service requirements, as provided in the Regional Sewer Agreement of September 2004. At the February 22, 2021 Regional Committee meeting, the Committee voted to increase the monthly user fee 3% each year for the next two years, with the first year's increase effective July 1, 2021. The following rates shall replace the rates currently in effect and shall be effective for all monthly sewer billings rendered to sewer users on and after July 1 of each year as shown below.

A) Sewer Rates:

1. Single Family Residential Sewer Service per account per month:

2016	2017	2018	2019	2021	2022
$6.75	$7.26	$7.80	$8.39	$8.64	$8.90

2. Multiple Family Residential, Public School and Church Sewer Service Rate per sewer service connection per month, a total of the following:

(a) Base Charge per sewer account:

2016	2017	2018	2019	2021	2022
$2.44	$2.62	$2.82	$3.03	$3.12	$3.21

(b) Gallonage Charge per 1,000 gallons of water delivered to the premises as determined in paragraph 2(c):

2016	2017	2018	2019	2021	2022
$0.69	$0.74	$0.80	$0.86	$0.89	$0.91

(c) The gallonage portion of the sewer service charge for multiple-family residential, school, hospital and church accounts shall be determined once each year during the month of March for each such account and the amount of the charge so determined shall be charged for each month for the following 12-month period. The charge shall be determined for each account by applying the above sewer rate to the average monthly water consumption during the months of December, January and February for each such account, except for schools, the average monthly water consumption shall be based on the water used in January and February. In the case of a service, which commences after the month of February, the average gallonage shall be determined by a reasonable comparison with the use of water by other customers receiving the same class of service under similar circumstances and conditions.

3. Mobile Home Parks, a total of the following:

(a) Base Charge, per mobile home space, per month:

2016	2017	2018	2019	2021	2022
$2.44	$2.62	$2.82	$3.03	$3.12	$3.21

(b) Gallonage Charge per 1,000 gallons of water delivered to the mobile home park as determined in paragraph 3(c):

2016	2017	2018	2019	2021	2022
$0.69	$0.74	$0.80	$0.86	$0.89	$0.91

(c) The gallonage portion of the sewer service charge for mobile home parks shall be determined as prescribed for multiple-family account in 2(c) above.

4. Commercial, Hospital, Residential Care/Boarding and Industrial Sewer Service (not including extra strength sewer charges). Rate per sewer connection per month, a total of the following:

(a) Base Charge per month per sewer account:

2016	2017	2018	2019	2021	2022
$2.44	$2.62	$2.82	$3.03	$3.12	$3.21

(b) Gallonage Charge per 1,000 gallons of water delivered to the premises:

2016	2017	2018	2019	2021	2022
$0.69	$0.74	$0.80	$0.86	$0.89	$0.91

5. Extra Strength Commercial, Hospital and Industrial Sewer Service Surcharge. Rate per sewer service per month shall be as follows per each 300 ppm of Biochemical Oxygen Demand (BOD) or Total Suspended Solids (TSS), or fraction thereof, in excess of the first 300 ppm of BOD or TSS, per 1,000 gallons of water delivered to the premises. Such surcharge shall be in addition to charge for Industrial Sewer Service listed in 4 above.

2016	2017	2018	2019	2021	2022
$0.27	$0.29	$0.31	$0.33	$0.34	$0.35

6. Recreational Vehicle Waste Dumping Station, per dumping facility, per month, in addition to other sewer charges as prescribed in 4. Commercial or Industrial Sewer Service as such Location:

2016	2017	2018	2019	2021	2022
$27.60	$29.67	$31.90	$34.29	$35.32	$36.38

B) Classifications:

1. Single-Family Service. Single-Family Residential Sewer Service shall be defined as the provision of sewer service for household domestic purposes in a building containing but one kitchen, designed and/or used to house not more than one family, including all necessary employees of such family, such building having a single sewer service connection. Mobile homes occupying a separate lot and providing permanent housing and with a separate sewer connection shall be classed as a single-family residential sewer service.

2. Multiple-Family Service. Multiple-family service shall be defined as sewer service for two or more families, living independently of each other, a family being defined as one of more persons living as a single housekeeping unit or household. Multiple-family sewer service shall include sewer service to apartment houses, multiple-family dwellings, motels providing permanent or semi-permanent housing and all other residential sewer services (except those defined as single-family residential sewer services and mobile home parks) providing permanent or semi-permanent housing.

3. Churches. Churches shall come under the multiple-family dwelling classification for sewer service and are defined as a building or structure whose principal use is for worship and in which the incidental use is for school purposes less than 12 hours per week.

4. Hospitals. Hospitals are included in the multiple-family classification and are defined as a building or structure used for the temporary housing of ill or injured persons and includes convalescent hospitals.

5. Schools. Schools are to be included in the multiple family classification and are defined as any building used for school purposes more than 12 hours per week, involving assemblage for instruction, education or recreation.

6. Mobile Home Parks. Mobile home parks, including travel trailer parks shall come under the mobile home classification and are defined as any area or tract of land having a sewer connection and where sewerage collection pipes are extended to two or more spaces occupied by or intended to be occupied by a mobile home, travel trailer or motor home which are defined as a vehicle with or without motive power which is designed, used or intended for use as a place of human habitation, or as eating, sleeping or living quarters, or any combination thereof. A space is defined as

the individual location having a sewer hookup for each such vehicle.

7. Commercial Sewer Service. Commercial sewer service is defined as all sewer service except single-family residential, multiple-family residential, church, hospital, residential care/boarding, school, mobile home park or industrial sewer service and shall include sewer service to buildings or structures for housing transients such as hotels and motels.

8. Industrial Sewer Service. Industrial Sewer Service shall be defined as the provision of sewer service to premises wherein the manufacturing or processing of a product is performed.

9. Extra-Strength Commercial, Hospital, and Industrial Sewer Service shall be defined as an industrial, commercial, or hospital sewer user discharging industrial wastes into the sewer facilities containing a total or more than 60 pounds of Biochemical Oxygen Demand (BOD) or Total Suspended Solids (TSS) in any one day and discharging wastes having an average strength in excess of 300 ppm of BOD or TSS.

   Biochemical Oxygen Demand (abbreviated as BOD) shall mean the quantity of oxygen, expressed in parts per million by weight utilized in the biochemical oxidation of organic matter under standard laboratory conditions for 5 days at a temperature of 20° Centigrade. The laboratory determinations shall be made in accordance with the procedures set forth in Standard Methods for the Examination of Water, Sewage and Industrial Wastes, published jointly by the American Public Health Association, the American Water Works Association and the Federation of Sewage and Industrial Wastes Associations.

10. Recreational Vehicle Dumping Station. A recreational vehicle dumping station is defined as a dedicated facility connected to the sewer collection system which accepts liquid wastes dumped from holding tanks of recreational vehicles such as travel trailers, motor homes and campers where such wastes pass into the sewer collection system, regardless of whether such wastes are accepted by the recreational vehicle dumping station operator with or without charge.

11. Vehicle Washes. Vehicle washes are defined as commercial buildings or structures used for washing vehicles. Self-service vehicle washes are coin-operated facilities serving the general public that require the customer to wash the vehicle. Full-service vehicle washes are facilities serving the general public wherein the vehicle is washed for the customer, either automatically or by attendants. All other vehicle and parts washing or steam cleaning facilities that discharge to the sanitary sewer will be reviewed by the Technical Advisory Group on a case-by-case basis.

12. Residential Care/Boarding Facility. A Residential Care/Boarding Facility is defined as a building or structure used for housing of persons requiring either long term supervision and general care, or any type of dependency recovery, with maximum of two beds per room. No additional charge shall be made for laundry or food and drink

preparation and serving facilities included in the Residential Care/Boarding Facilities. Charges for such a facility shall never be less than that for a Single Family Residence (SFR).

C. Application of Rates:

1. At the end of each month, each entity shall determine the amount to be paid to the City of Medford for sewage treatment, such amounts are to be deposited in the Sewage Treatment Plant Operations and Maintenance Fund. A detailed breakdown showing the computation of such monthly payment by each entity shall be submitted with such payment and shall be kept on file by Medford. At quarterly intervals, Medford will distribute to each entity a copy of the monthly computations of the sewage charges of each entity.

2. Where there are sewer users (other than single-family residential) with sources of water supply other than or in addition to regularly metered municipal water service, it shall be the responsibility of the entity within whose service area such sewer users are located to install, or have installed, the necessary well supply meters or other accurate device to measure the amount of water entering the premises of such sewer users and to include such gallonages for computation of the entity's sewer charge.

3. For all industrial, commercial, mobile home park, multiple-family, residential care/boarding, school, church and hospital sewer users, the gallons of water entering the premises from all sources shall be used for determining the sewer service charge unless a completely separate set of piping and water service is in use for the portion of water entering the said premises which may be used for lawn sprinkling, cooling or other such use, no part of which can enter a sanitary sewer.

4. For mobile home parks including overnight trailer parks, the base charge per space to which sewer facilities are extended shall apply, regardless of whether or not the space is occupied.

ADOPTED by the Regional Committee at Medford, Oregon, this 22nd day of February, 2021 by the following vote:

AYES: 3

NAYS: Ø

AND SIGNED by the Chair this 4 day of March, 2021.

ATTEST: Norma L. Hollands

Secretary

Chair

RESOLUTION NO. **41**

A RESOLUTION OF THE REGIONAL COMMITTEE modifying the schedule and definitions of system development charge (SDC) categories for sewage treatment plant expansion.

BE IT RESOLVED BY THE REGIONAL COMMITTEE that:

I

The following schedule and definitions of system development charges (SDCs) is hereby adopted to replace those now in effect. Note: SDCs are a percentage of the Single Family Residence rate.

TYPE OF BUILDING & SEWER USE	% OF SFR RATE	SYSTEM DEVELOPMENT CHARGE
1. Single Family Residence (SFR)		$ 1659.57 each
2. Multiple Family Residence/Mobile Home Park/Accessory Dwelling Unit	65%	$ 1078.72 per dwelling unit
3. Recreational Vehicle Space in Recreational Vehicle Park (Common building at additional commercial rate and laundry areas at laundry rate)	50%	$ 829.79 per space
4. Recreational Vehicle Waste Dumping Station	65%	$ 1078.72per station
5. Schools	3%	$ 49.79 per student capacity
6. Churches (School uses at additional per student capacity rate	64%	$ 1062.12 per 100 seats capacity
7. Hospitals – general	100%	$ 1659.57 per bed
8. Convalescent Hospitals/Rest Homes/Assisted Living Facilities	50%	$ 829.79 per bed
9. Residential Care/Boarding Facilities/Adult Foster Care	25% or 100%	$ 414.89 per room or $ 1659.57 whichever is greater
10. Lodging Facilities (Additional charges for restaurant or lounge at food prep/serving rate, guest laundry area at laundry rate, and all meeting room areas and individual room kitchens/kitchenettes with fixtures at commercial rates).		
a) Hotels and Motels	25%	$ 414.89 per room or motel unit
b) B&Bs	100%	$1659.57 each SFR plus 25% ($414.89) per bedroom greater than 4
c) Homeless Shelters, etc.	N/A	To be determined on an individual basis by Technical Advisory Group
11. Food Preparation and/or Serving Area	15%	$ 248.94 per 100 square feet
12. Vehicle Wash		
a) Self Service Vehicle Wash	117%	$ 1941.70 per bay
b) Full Service Vehicle Wash	1,566%	$25,988.87 per bay
c) Other Vehicle Washes	N/A	See Wet Industrial
13. a) Laundries & Laundromats	30%	$ 497.87 per 100 square feet
b) Industrial Laundries	N/A	See Wet Industrial
14. Commercial, Office and Dry Industrial		Charge for each plumbing fixture to be installed
Bathtub w or w/o shower	13%	$ 215.74

TYPE OF BUILDING & SEWER USE	% OF SFR RATE	SYSTEM DEVELOPMENT CHARGE
Dental Unit or Cuspidor	10%	$ 165.96
Dishwasher	10%	$ 165.96
Disposal	10%	$ 165.96
Drinking Fountain	5%	$ 82.98
Floor Drain	1.3%	$ 21.57
Fountain/Backwash	10%	$ 165.96
Kitchen Sink	8%	$ 132.77
Laundry Tray	8%	$ 132.77
Lavatory	5%	$ 82.98
Service Sink	8%	$ 132.77
Shower (each head)	13%	$ 215.74
Swimming Pool/Backwash	10%	$ 165.96
Urinal	17%	$ 282.13
Urinal Trough (for each 2-foot section)	17%	$ 282.13
Wash Sink (for each set of faucets)	8%	$ 132.77
Washing Machine	7%	$ 116.17
Water Closet	33%	$ 547.66

In case of a remodel in types 5-13 which results in no increase in the units on which the charge for a new building is calculated, there shall be no additional SDC for the remodel, even if additional plumbing fixtures are installed.

15. Wet Industrial	To be determined on an individual basis by the Technical Advisory Group.
16. Undefined Building and Sewer Use	To be determined on an individual basis by the Technical Advisory Group.
17. Additional Loading or Change of Use	Determined on basis of new use for entire facility less credit for former use. No refunds if new use is less than former use.
18. Large Wet Industrial	To be determined on an individual basis by the Technical Advisory Group.

II

The following are the definitions of the classifications used in establishing the system development charges:

1. **A Single Family Residence (SFR)** is defined as a building designed and/or used to provide independent living for not more than one family, including all necessary employees of such family. Mobile homes occupying a separate lot and providing permanent housing with a separate sewer connection shall be classified as an SFR. *A guesthouse or room* is an accessory building or room designed, constructed and used to provide temporary sleeping accommodations for guests, or for members of the same family as that occupying the main structure. A guesthouse or room contains no kitchen or kitchen facilities. A guesthouse shall be considered a part of the SFR and no additional fee shall be charged. *Kitchen or kitchen facilities* shall be any area separate from bathing and sanitation facilities which can be utilized for food preparation and which includes a sink or plumbing for a sink and may include any or all of the following: a dishwasher, stove, oven, or space for a refrigerator. Any addition to an existing SFR, which does not result in an additional dwelling unit, will be exempt from additional charge. However, any activity conducted from an SFR, which requires a business license

may be subject to an additional charge, depending on the nature of the activity.

2. **A Multiple Family Residence (MFR)** is defined as a building or a group of buildings housing two or more families, living independently of each other, a family being defined as one or more persons living as a single housekeeping unit or household with sewer service being provided through not more than one sewer connection. This definition includes manufactured and mobile home parks. Common buildings requiring sewer service shall be charged as commercial buildings. Buildings or portions of buildings housing common laundry facilities shall be charged as laundries and laundromats. Buildings or portions of buildings housing food service areas shall be charged as food prep and service areas. However, laundry facilities located in individual dwelling units shall be considered incidental to the standard multi-family charge. *An Accessory or Ancillary Dwelling Unit (ADU)* is defined as a residential dwelling unit, with a kitchen or kitchen facilities, that can be used for independent living and is located on the same lot as a single family residence (SFR), as defined by each entity in its own code, ordinances, or resolutions. An ADU may be a separate building or a space within an SFR. An ADU shall be charged the same SDC as an MFR. Any activity conducted from an MFR or ADU, which requires a business license, may be subject to an additional charge, depending on the nature of the activity.

3. **A Recreational Vehicle Park** is defined as any area or tract of land having a sewer connection, and where sewerage collection pipes are extended to two or more spaces occupied by, or intended to be occupied by a travel trailer or motor home which are defined as a vehicular type unit primarily designed as a temporary living quarters for recreational, camping or travel use, which either has its own motive power or is mounted on or drawn by another vehicle. A recreational vehicle space is defined as the individual location having a sewer hookup for each such vehicle. For purposes of determining the Systems Development Charges (SDCs) for recreational vehicle parks' common buildings such as recreation halls, etc., shall be charged as commercial buildings. Buildings housing laundry facilities shall be charged as laundries and laundromats and food or drink service buildings shall be charged as food preparation and/or serving.

4. **A Recreational Vehicle Waste Dumping Station** is defined as a building or structure used for the dumping of sanitary sewer wastes from recreational vehicle holding tanks, including gray water from sinks and showers. (This excludes an individual collector installed by a homeowner for his/her own use.)

5. **A School** is defined as any building or group of buildings used for school purposes more than 12 hours per week, involving assemblage for instruction, education, or recreation. Schools may be public or private and may include, but not be limited to, day care/pre-school, kindergarten, elementary schools, middle/junior high schools, senior high schools, junior colleges, continuing education facilities, professional/vocational schools, and beauty colleges. Charge shall be based on student capacity of classrooms. No additional charge shall be made for school gymnasiums, locker rooms or cafeterias. Unless other supporting data is provided by the applicant, the design capacity of classroom area, per student, shall be based on the following:

   a. Pre-school through 5th grade: 35 sf per student;
   b. 6th grade through 8th grade: 30 sf per student;
   c. 9th grade through college: 25 sf per student

6. **A Church** is defined as a building or structure whose principal use is for worship and in which the incidental uses for school or recreational purposes is less than 12 hours per week. Church buildings used for school purposes more than 12 hours per week shall be charged at the 'school' SDC rate in addition to the charge per 100 seats as a church. No additional charge shall be made for kitchens, multi-purpose rooms, or fellowship halls and related plumbing fixtures. Unless other supporting data is provided by the applicant, the design capacity of a church, per seat, shall be based on 15 sf per seat of sanctuary floor area (including aisles, stage, altar area, etc.).

7. **A General Hospital** is defined as a building or structure used for the temporary housing of ill or injured

persons and containing facilities for medical and surgical treatment of such persons. No additional charge shall be made for laundry, and food and drink preparation and serving facilities included in hospitals.

8. **<u>A Convalescent Hospital, Rest Home, or Assisted Living Facility (ALF)</u>** is defined as a building or structure used for the housing of persons convalescing from illness or injury, or persons requiring close personal care. No additional charge shall be made for laundry or food and drink preparation and serving facilities included in the facility. Rooms or units containing kitchen facilities shall be charged at the MFR rate.

9. **<u>A Residential Care, Boarding, or Adult Foster Care Facility</u>** is defined as a residential building or structure, generally in a residential neighborhood, used for housing of persons requiring either long-term supervision and general care, or any type of dependency recovery. The facility shall be considered an SFR for up to four bedrooms, with an additional charge per bedroom above four. No additional charge shall be made for laundry or food and drink preparation and serving facilities included in the facility. Individual bedrooms may not contain kitchen facilities. This language distinguishes between 'assisted living' facilities, which tend to be larger-scale 'businesses', and the smaller scale homes which provide more personal foster care.

10. **<u>A Lodging Facility</u>** is defined as a building or group of buildings used for temporary housing of persons, containing rooms or units intended for the use of transient persons. Included within this definition are hotels, motels, and bed and breakfast accommodations. Homeless shelters and/or dormitory-style housing facilities shall be considered by the TAG on a case-by-case basis.
    a. <u>Hotels/Motels</u>: Any building or group of buildings with guest rooms intended or designed to be rented for temporary occupation by guests. Those areas within hotels and motels used for commercial preparation of and serving of food and drink shall be charged at the rate for food preparation and/or serving, including guest breakfast serving and eating areas. Kitchens or kitchenettes in individual rooms shall be charged at commercial rates based upon fixtures. Commercial areas within hotels and motels, including convention facilities, meeting rooms and other such common areas other than lobby areas shall be charged at the rate for commercial and dry industrial areas. Areas used for guest or public laundry facilities in hotels and motels shall be charged at the area rate for laundries and laundromats. In-house laundries for use by staff shall be considered incidental to the per-room SDC rate. Such additional charges for food and drink, commercial areas and laundry shall be in addition to the charge per room or motel unit.
    b. <u>Bed and Breakfast (B&B) Accommodations</u>: A B&B is an SFR, or part thereof, other than a hotel, motel or MFR, where traveler's accommodations and breakfast are provided for a fee on a daily or weekly room rental basis. A B&B shall be charged at the SFR SDC-rate for the first four (4) bedrooms and at the Lodging Facility per-unit SDC rate for each additional bedroom. No additional charge shall be made for the kitchen unless an existing kitchen is remodeled and new fixtures added, at which time it shall be charged at the rate for commercial and dry industrial areas.

11. **<u>Food Preparation and/or Serving</u>** includes restaurants, lounges, taverns, delicatessens, coffee carts, kiosks, and wholesale and retail bakeries, but does not include outdoor seating areas for the above, nor canneries, dairies, cheese factories, packing houses and similar facilities, which shall be classified as "Wet Industrial" under Item 15 of these definitions. The entire square footage of the tenant space or building shall be included in the chargeable area. Restroom facilities shall not be segregated out of the chargeable area for those eating and drinking establishments that occupy an entire tenant space or building.

12. **<u>Vehicle Washes</u>** are defined as commercial buildings or structures used for washing vehicles.
    a. <u>Self-Service Vehicle Washes</u> are coin-operated facilities serving the public that require the customer to wash the vehicle.
    b. <u>Full-Service Vehicle Washes</u> are facilities serving the public, wherein the vehicle is washed for the customer, either automatically or by attendants.

c. Vehicle wash facilities that recycle or reclaim water, and all parts washing or steam cleaning facilities that discharge to the sanitary sewer, are classified as **Other Vehicle Washes** and will be reviewed on a case-by-case basis.

13. a) Laundries and Laundromats are defined as commercial buildings and structures, or parts of commercial buildings and structures used for housing and operating laundry equipment by the public to wash clothes and linens for personal use.
b) Industrial Laundries are defined as buildings or structures or parts of buildings and structures used for housing and operating laundry equipment for the large scale washing of uniforms, towels, linens, etc. The anticipated volume and strength of the sewage to be generated from an industrial laundry would be considerably more than that from a commercial laundry or laundromat. Industrial laundries shall be classified as "Wet Industrial Buildings".

14. Commercial Buildings are defined as all buildings used for conducting of wholesale or retail trade. Dry industrial buildings or structures are those that house light industrial activities where use of water and subsequent discharge of sewer does not occur in connection with the industrial process. Warehouses and other storage buildings with sewer connections are classified as dry industrial buildings.

15. Wet Industrial Buildings are defined as those buildings and structures housing industrial activities where the use of water and subsequent discharge to the sewer occurs in connection with an industrial process. Facilities with a discharge of 10,000 gallons per day or greater are considered wet industrial. Other facilities that discharge less than 10,000 gallons per day, and whose anticipated strength of the sewage to be generated from the facility is greater than domestic sewage strengths may also be considered wet industrial. Those facilities will be reviewed on a case-by-case basis. The anticipated volume and strength of the sewage to be generated from the facility in relation to the volume and strength of sewage from an average single-family residence shall be considered when calculating SDCs.

Any facility issued an Industrial Waste Discharge Permit under the Regional Water Reclamation Facilities Pretreatment Program that does not meet the Large Wet Industrial classification will be assessed SDCs at the classification of Wet Industrial. The SDC for flow shall be based upon the Monthly Average Limit per Definition 18. Any discharger determined to be in Significant Non-Compliance (SNC) of the Monthly Average Limit for flow per the criteria listed in the Public Participation Requirement subsection A or B of the City of Medford or Rogue Valley Sewer Services Code requires the payment of additional SDCs for said parameter.

Except for large wet industrial load increases as covered in Section 18, the SDC for wet industrial shall be determined on an individual basis for the TAG's approval utilizing the formula listed below:

$$SDC = \frac{GPD}{350} \times SFR \times F$$

GPD = Anticipated volume of discharge to sewer in gallons per day.
SFR = Current SDC for single-family residence.
F = Extra strength factor, whole number multiplier derived for every 300 ppm of biochemical oxygen demand or suspended solids, or fraction thereof, in excess of the first 300 ppm of biochemical oxygen demand or suspended solids.

Example:

Factor	Range
1	0-300
2	301-600
3	601-900

(Continues per 300 increment)

16. **Undefined Buildings** and sewer use are those not defined above.

17. **Additional Loading or Change of Use** is defined as an increased demand for wastewater treatment from an existing wet industrial building or structure. The additional loading may be the result of replacement or addition to an existing structure or facility, a change in use, or a fifteen percent (15%) or greater increase above the permitted volume or character of the wastewater constituents being discharged.

    Except for large wet industrial loads as covered in Section 18, the System Development Charge (SDC) shall be determined on the basis of the number of single-family residence equivalent units with the additional loading or the new use with credit being given for the number of single-family residence equivalent units of the original facility. No refund will be given if the change of use results in a decreased sewer loading.

18. **Large Wet Industrial Loads** are defined as new or increased loads greater than 25,000 gallons per day (gpd), 60 pounds per day (ppd) BOD, or 60 ppd TSS. SDCs for large industrial loads shall be calculated for the TAG's approval based upon the following unit costs for flow, biochemical oxygen demand (BOD), and total suspended solids (TSS):

Flow	$2.28 per gpd
BOD	$411.69 per ppd
TSS	$270.57 per ppd

    These unit costs will be reviewed and revised as needed by the TAG at least every two years.

    The SDC for the load being requested shall be based upon the Monthly Average Limit for each of the above-mentioned parameters. Monthly Average Limit is defined as the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

    Any discharger determined to be in Significant Non-Compliance (SNC) of a Monthly Average Limit parameter per the criteria listed in the Public Participation Requirement subsection A or B of the City of Medford or Rogue Valley Sewer Services Code requires the payment of additional SDCs for said parameter.

    The maximum allowable loadings shall be determined through established methodology in accordance with the Regional Water Reclamation Facility's most recently approved Facilities Plan. All penalties and corrective actions required will be in accordance with the approved pretreatment ordinances.

III

Resolution 41 increases Sewer SDCs 2.1% based on the annual adjustment tied to the January-to-January Engineering News Record Construction Cost Index (ENR-CCI). Resolution 41 supersedes all previous resolutions related to SDCs for sewage treatment plant expansion. The new schedule and definitions shall become effective July 1, 2021. The sewer SDCs are adjusted each year by the ENR-CCI as adopted at the May 18, 2015 Regional Committee Meeting.

ADOPTED by the Regional Committee at Medford, Oregon, this 17th day of May, 2021 by the following vote:

AYES: 3.

NAYS: Ø.

AND SIGNED by the Chair this 3 day of June, 2021

SIGNED: ______________________
Chair

ATTEST: Norma J. Hollander
Secretary

ROGUE VALLEY SEWER SERVICES

Location: 138 West Vilas Road, Central Point, OR - Mailing Address: P.O. Box 3130, Central Point, OR 97502-0005
Tel. (541) 664-6300, Fax (541) 664-7171 www.RVSS.us

October 6, 2008

To: Regional Technical Advisory Group
From: Carl Tappert, PE
RVS District Engineer

RE: Calculation of Base Rate for Interceptor O&M

The Interceptor Base Rate is a composite rate which combines the O&M expenses for the regional interceptor and the Dunn Pump Station. Allocation of costs to each party would be based upon the amount of flow discharged from each party. (See 20 year agreement, Page 19, Section F)

The current allocation is based on the measured flow from September 2003 through August 2004. The base rates under the current allocation are as follows:

	Interceptor	KPS	Total Cost	Total ERU	Base Rate
RVS	$23,840	$130,905	$154,745	20,227	**$0.64**
Medford	$19,194	$40,240	$59,434	30,286	**$0.16**
Jacksonville	$1,062	$13,255	$14,317	1,343	**$0.89**
Phoenix	$904	$0	$904	1,676	**$0.04**
Total	$45,000	$184,400	$229,400		

Since 2004 both Jacksonville and Phoenix have elected to annex into RVS. The proposed allocation includes these cities in the measurements for RVS and is based on measured flows from January 2007 through December 2007 is as follows:

Interceptor
RVS 57.8[1]%
Medford 42.2%

Dunn Pump Station
RVS 85.1%
Medford 14.9%

---

[1] RVS flows are calculated by subtracting all other flows from the measured flow at the treatment plant. All I&I within the interceptor system outside of city limits is attributed to RVS.

The Equivalent Residential Units for each Party is calculated using the method described by West Yost & Associates in the 1999 Interceptor Master Plan. Using this method the total fees paid to the Regional Water Reclamation Facility by each Party is divided by the single family residential rate of $5.84 per month. During this time period the ERU's for each Party were as follows:

RVS	24,053[2]
Medford	30,839

The Interceptor Base Rate is calculated by assigning Interceptor and DPS operations and maintenance costs to each Party based on their flow contributions to these facilities. This combined cost is then divided by the Party's total number of ERU's to determine the IBR. The cost allocation is based on the approved budget for FY09 of $189,000 for DPS and $105,000 for the interceptor. Both of these funds include a $50,000 contingency. Without the contingency, the allocated spending is $139,000 for DPS and $55,000 for the interceptor.

This calculation gives the following results:

	Interceptor	DPS	Total Cost	Total ERU	Base Rate
RVS	$31,790	$118,289	$150,079	24,053	**$0.52**
Medford	$23,210	$20,711	$43,921	30,839	**$0.12**
Total	$55,000	$139,000	$194,000		

[2] The RVS contribution does not include treatment charges from White City or Eagle Point, which do not flow through the interceptor system.

RESOLUTION NO. 2019-11

A RESOLUTION REVISING RATES FOR WASTEWATER / SEWER SERVICE PURSUANT TO ASHLAND MUNICIPAL CODE SECTION 14.08.035 AND REPEALING RESOLUTION 2018-13.

THE CITY OF ASHLAND RESOLVES AS FOLLOWS:

SECTION 1. The "Wastewater / Sewer Rate Schedule" marked as "Exhibit A" and attached to this Resolution, shall be effective for actual or estimated consumption on or after July 1, 2019.

Prorated calculations are permitted for any bills prepared for a partial month or billing period that overlaps the effective date of this Resolution.

Miscellaneous Charges and Connection Fees established by previous resolutions remain in effect until revised by separate Council Action.

SECTION 2. Copies of this resolution shall be maintained in the Office of the City Recorder.

SECTION 3. Classification of the fee. The fees specified in Section 1 and Section 2 of this resolution are classified as not subject to the limits of Section 11b of Article XI of the Oregon Constitution (Ballot Measure 5).

SECTION 4. Resolution 2018-13 is repealed.

This resolution was duly PASSED and ADOPTED this 4th day of June, 2019, and the effective date is July 1, 2019 upon signing by the Mayor.

Melissa Huhtala, City Recorder

SIGNED and APPROVED this 5th day of June, 2019.

John Stromberg, Mayor

Reviewed as to form:

David Lohman, City Attorney

City of Ashland, Oregon
SEWER RATE SCHEDULE

CITY OF ASHLAND

All sewer service provided by the City of Ashland shall be in accordance with Chapter 14.08 of the Ashland Municipal Code.

Sewer quantity charges shall be adjusted annually in April based on the winter water consumption for the months of January, February, and March for all customers whose quantity charge is not determined by actual consumption.

No exception from these rates will be allowed for unoccupied units.

Billing:

The minimum monthly charge shall be the sum of the Monthly Service Charge and Quantity Charge. Billing shall occur monthly with charges due and payable upon receipt.

Service Charge:

Residential	July 2018	July 2019
Monthly Service Charge, per unit	$ 32.63	$ 33.94
Quantity Charge, per cf	$ 0.04869	$ 0.05064
Quantity charge is based on winter water average in excess of 400 cubic feet, per unit		

Quantity Charge for single family residential water accounts with no consumption during the months of January, February and March will be based on 700 cubic feet.

Multi-family residential accounts are all accounts in which more than one residential dwelling is attached to the same water service and shall be assessed a Monthly Service Charge for each unit. Quantity Charge for multi-family residential water accounts with no consumption during the months of January, February and March will be based on 500 cubic feet per unit.

Commercial, Industrial, and Governmental	July 2018	July 2019
Monthly Service Charge	$ 34.05	$ 35.41
Quantity Charge, per cf	$ 0.05405	$ 0.05621
Quantity charge is based on actual monthly consumption		

Mixed residential and commercial accounts will be billed as commercial.

For commercial, industrial or governmental users where monthly water consumption is not measured through City water meters, the sewer rate will be established as follows: The annual water consumption will be estimated utilizing water consumption records of similar users or water consumption record of past use, if available. Quantity Charge is based on the twelve month average estimated water consumption. This rate shall be effective beginning in the month after the rate is determined until the rate schedule is amended by resolution of the City Council. Water consumption determined in this manner shall be lowered if the user can demonstrate through the use of a meter approved by the City that the actual consumption of the user is less than the estimate.

Special Cases:

Greenhouses, Churches, and Schools (K-12) operating on a nine month school year	July 2018		July 2019	
Monthly Service Charge	$	34.05	$	35.41
Quantity Charge, per cf	$	0.05405	$	0.05621
Quantity charge is based on winter water average in excess of 400 cubic feet				

Bed and Breakfasts and Ashland Parks Bathrooms	July 2018		July 2019	
Monthly Service Charge	$	34.05	$	35.41
Quantity Charge, per cf	$	0.05405	$	0.05621
Quantity charge is based on the sum of the winter water consumption				

Exemptions to commercial and industrial sewer rates:

A: If a commercial, industrial, or governmental user can demonstrate that the volume of sewage discharged by the user is less than 50% of the water consumed, the City Administrator may adjust the quantity charge accordingly.

B: Water sold through an irrigation meter is exempt from sewer charge.

Sewer rates outside the city limits:

A: The Monthly Service Charge shall apply to those sewer users permitted under Section 14.08.030 of the Ashland Municipal Code.

B: The sewer rates for users outside the city limits shall be two times the sewer charges for inside the city limits.

C: Quantity charge for metered residential accounts is based on the average winter water consumption in excess of 400 cubic feet, per unit, per month and shall be adjusted annually in April.

D: Quantity charge for unmetered residential accounts will be calculated on an average winter water usage of 700 cubic feet for single family residences, and 500 cubic feet, per unit, for multi-family residences.

E: Quantity charge for commercial, industrial, and governmental accounts will be based on actual monthly water consumption.

Memorandum

July 23, 1991

To:
Brian Almquist, City Administrator
Mayor and City Council
Eric Dittmer, RVCOG
Dennis Barnts, Water Quality Superintendent
Pam Barlow, Administrative Assistant

From: Steven Hall, Public Works Director SMH

Subject: Wastewater Treatment Plant Facilities Plan

At the last discussion of the Ashland Wastewater Treatment Plant Facilities Plan Review in April, the Council requested additional information. In addition, Brown and Caldwell had a few minor corrections.

Those items are attached for changes in your copy of the Facilities Plan. I have taken the liberty and added page names and inserted the changes on the pages.

They have been on my desk for some time (infamous black hole), so it is not Brown and Caldwell's delay!

If you have any questions, give me a call.

SMH:rm\wwtpfp.mem

Encl: Amendments

Brown and Caldwell
Consultants

2300 Oakmont Way
Suite 100
Eugene
Oregon 97401-5556
(503) 686-9915
FAX (503) 686-1417

May 28, 1991

Mr. Richard Santner
Department of Environmental Quality
811 Southwest Sixth Avenue
Portland, Oregon 97204

13-4384

Subject: Amendments to April 6, 1991, City of Ashland Wastewater Facilities Plan Draft

Dear Mr. Santner:

On September 21, 1990, the Environmental Quality Commission (EQC) approved the *City of Ashland Program Plan for the Improvements to the Wastewater Treatment Plant Discharges into Bear Creek*. The Program Plan called for a two-phased report with the first phase to be submitted by May 31, 1991.

Brown and Caldwell provided draft copies of the first phase report to the city and the Department of Environmental Quality (DEQ) on April 6, 1991. This information was then presented and discussed in a city council meeting on April 16, 1991. Our draft report was accepted by the council with minor additions.

Attachment A includes additions and modifications to the April 6, 1991, draft addressing both DEQ and city council comments. As we discussed, the April 6, 1991, draft in combination with this letter complies with the interim report requirements stipulated by the EQC.

Figure 1 shows the next steps to be followed by the city and DEQ in the facilities total maximum daily load (TMDL) compliance process. We understand that the DEQ will continue sampling and reviewing flow monitoring information for Bear Creek until approximately February 1992. At that time we expect that the TMDLs and waste load allocation (WLA) to Bear Creek will be finalized so that we can complete the second phase of the facilities plan report by April 1992.

This schedule would allow the city to design improvements and begin construction by January 1992. Following a two-year construction and start-up period, the city would be in compliance with their WLA by the end of December 1994.

The city will continue to investigate issues related to the treatment and disposal alternatives discussed in our draft plan. From now until final TMDLs and WLAs are available next spring, the city will work with the DEQ to:

- Assist DEQ and State Fish and Wildlife to integrate more fully fisheries concerns into the TMDL process for Bear Creek.
- Investigate effluent water rights.
- Assist DEQ with TMDL and discharge permit development.
- Pursue Talent Irrigation District effluent reuse.
- Investigate effluent water rights transfer with acquisition of effluent irrigation land.
- Refine Medford, Bear Creek Valley Sanitary Authority, and Ashland wastewater treatment and disposal costs.

Thank you for your assistance. We look forward to working with you on the next phase of this challenging project.

Very truly yours,

BROWN AND CALDWELL

John Holroyd

John Holroyd
Project Manager

JEH:jdc.cm
Enclosures

cc/enc: Ashland City Councilors
Mr. Eric Dittmer, Rogue Valley Council of Governments
Mr. Terry Gould, Brown and Caldwell, Eugene
Mr. Steve Hall, City of Ashland

13.7 inches, and 1988 was the fifth consecutive year of below-average rainfall. In 1988, the DEQ measured flows lower than 10 cfs in Bear Creek above Ashland. These measurements were made in the fall after irrigation releases from Emigrant Lake were stopped but before winter rains began.

Table 3-3. Monthly and Annual Mean Discharge in Bear Creek at Medford

Month	Minimum, cfs	Maximum, cfs	Mean, cfs	Standard deviation, cfs	Coefficient of variation	Percent of annual runoff
October	4.7	216	33	32	.98	2.4
November	8.2	246	59	50	.85	4.3
December	17.0	1,137	147	195	1.33	10.7
January	13.0	1,080	221	238	1.08	16.0
February	12.0	873	223	194	.87	16.2
March	14.0	787	202	163	.81	14.7
April	4.9	686	197	133	.68	14.3
May	1.5	391	134	99	.74	9.7
June	2.1	232	73	55	.75	5.3
July	.5	95	29	23	.78	2.1
August	.4	115	29	27	.93	2.1
September	.7	92	31	27	.85	2.3
Average Annual	8.4	304	114	75	.66	100.0

NOTE: Data accumulated by USGS from 1921 through 1981. Minimum and maximum values are extreme for entire period of record. Adapted from Brown and Caldwell, 1989.

The United States Geological Survey established ~~a Bear~~ downstream Creek gauging station at Ashland in the fall of 1990. This station is located ~~upstream~~ of the outfall from the Ashland wastewater treatment plant. Flow data will be reported regularly by the USGS starting in March 1991. The preliminary flow data from this gauging station shown in Table 3-4 show a minimum flow of 10 cfs on October 1.

The DEQ reportedly monitored a flow of about 3 cfs at the Ashland gauging station while sampling in early February 1991.

Ground water resources are minimal. The Bear Creek Basin consists of four aquifer units, including Quaternary alluvium, Tertiary volcanic rocks of the western Cascades, Tertiary sedimentary rocks, and Paleozoic - Mesozoic rocks. The Quaternary alluvium deposits that underlie much of Bear Creek Valley are only a few feet thick, and are too small in extent to be a major source of ground water. In addition, the alluvium contains a large percentage of clay and yields only small quantities of water. The Tertiary volcanic rocks, the Tertiary sedimentary rocks, and the Paleozoic - Mesozoic rocks each consist of low-permeability rocks capable of yielding only small quantities of water.

Alternative 2

TITLE: LIMITED PLANT MODIFICATIONS, WINTER DISCHARGE OF TREATED EFFLUENT TO MEDFORD

DESCRIPTION: Alternative 2 assumes that only limited modifications would be made at the Ashland WWTP and that no plant effluent would go to Bear Creek. Winter effluent from the plant would go to the Medford WWTP in both Alternatives 2A and 2B. Under Alternative 2A, summer effluent would be spray irrigated on city-owned land. Alternative 2B would convey summer effluent to the Medford WWTP for further treatment and disposal. A treated effluent flow equalization pond would be included in this alternative to provide flexibility for the irrigation operation. A portion of the flow would be directed through an adjacent wetland area to receive additional polishing prior to discharge to Bear Creek. Figure 8-3 shows a flow schematic of Alternatives 2A and 2B.

PLANT MODIFICATIONS: Plant modifications would include addition of fine bubble diffusion to the undersized secondary aeration system. A second 65-foot-diameter secondary clarifier would be added to provide redundancy and PWWF capacity. Effluent disinfection equipment would remain unchanged except chlorine containment and scrubbing equipment would be added for safety reasons.

A 20-acre effluent storage pond would be included to balance the summer irrigation requirements under Alternative 2A. A pond of approximately the same size would be included in Alternative 2B to store peak flows prior to discharge to the BCVSA interceptor. An effluent pumping station would be required with both Alternatives 2A and 2B.

Major modifications would be required to the sludge treatment system under both Alternatives 2A and 2B. The existing aerobic digester would be taken out of service and a new anaerobic digester the same size as the existing anaerobic digester would be built. The existing anaerobic digester would be rehabilitated with a new cover as well as new heating, mixing, and circulation pumping systems. The existing secondary digester would be demolished. A 20-foot dissolved-air flotation thickener would be required to thicken waste activated sludge.

Sludge storage would be handled in an off-site facultative sludge lagoon (FSL). Figure ~~8-4~~ 8-3 shows a typical detail of a FSL. A 3.0-acre FSL would permit the plant to operate at optimum solids loadings. Presently, the plant must adapt to increasing solids loadings as solids are stored in the treatment system through the winter.

Environmental Concerns

Each of the alternatives discussed will have some degree of environmental effect. This section will address the potential effects in respect to air quality, noise, wetlands, and fisheries in Bear Creek.

Air Quality. All the alternatives will include significant construction activities at the treatment plant site. Alternatives 1A and 4 would entail the most modifications to the plant site. Dust generation would be a principal concern. Dust problems can be mitigated by a conscientious watering program during the dry periods.

Any existing odor problems associated with the secondary treatment process units should be reduced as more aeration capacity is added. Although typically the headworks of a treatment plant can release odors, to date, the existing headworks has not been identified as a source of odors. If future study indicates that the headworks does release odors, odor control equipment can be added under Alternatives 2, 3, and 4. When properly operated, the FSL included in Alternatives 2, 3, and 4 would not be a source of odors.

Noise. Noise will be generated during plant construction or demolition activities. A contractor would be required to conform to city ordinances regarding maximum allowable noise levels and permitted times of construction during each day. The construction period required for Alternative 1A would be approximately 1 month at the plant site and 12 months for the interceptor construction. Alternatives 2A, 2B, 3A, and 3C would each take approximately 12 to 16 months at the plant site. Due to the complexity of Alternative 4, this alternative might take somewhat longer to complete.

After the expanded plant is in operation, none of the alternatives should produce noise levels higher than the current plant operation. Replacing the existing surface aerators would remove a major source of noise.

Wetlands. There is no indication that the area shown for plant expansion would qualify as wetlands habitat. The wetlands polishing treatment area included in Alternatives 2, 3, and 4 would be protected and improved. Any potential irrigation or FSL site would be investigated to ensure that wetlands deterioration would not result.

Bear Creek Fisheries Impacts

Low flow conditions are major impediments to the expansion of fisheries on Bear Creek. In the mid 1970s, Oregon State Fish and Wildlife estimated the minimum flows preferred for development of fisheries in Bear Creek. Table 9-13 compares these minimum preferred flows for fisheries with actual Bear Creek flows at Ashland from June to December 1990. The Ashland WWTP flows and the percent of WWTP flow to total creek flow is also provided.

Potable Water Impacts. The impact of an alternative upon the area's potable water resources was evaluated. Alternatives 2A and 3A, which include irrigation land, may have a positive impact on Ashland potable water supplies if existing T.I.D. water rights can be transferred. Alternative 4, which would leave all Ashland effluent in Bear Creek, has the greatest impact on flows available for all uses. Alternative 4 also would produce the highest level of effluent, which would be further purified if potable water was generated from Ashland's effluent.

Table 9-13. Comparison of Minimum Flows for Fisheries to Bear Creek Flows

Period	Flow, cubic feet per second(cfs)	Actual Bear Creek flows, cfs, at date[1]	% flow from Ashland WWTP
January to May	100		
June	70	70.8 (7/23/90)	3.7
July, August	40	49 (8/21/90)	5.8
September	125	32.4 (9/20/90)	9.3
October	125	10 (10/1/90)	30.1
November, December	100	31 (12/10/90)	11.5

1 Bear Creek flows as reported in Table 3-4.

All alternatives except Alternative 4 would result in non-discharge of 3.8 cfs (2.43 mgd) of Ashland effluent to Bear Creek, at least during the summer and fall. During October of last year, Ashland's effluent comprised about 30 percent of Bear Creek total stream flow at Ashland. However, the projected summer flow from the Ashland plant would be about 8 percent of the preferred October stream flow, according to Oregon State Fish and Wildlife.

It is unknown at this time what effect withdrawal of Ashland's effluent might have upon fisheries in Bear Creek. The DEQ acknowledges that there may be trade-offs between the desire for the highest quality effluent and Ashland's ability to pay for such an effluent quality, and the desire to maintain flows in Bear Creek. The DEQ has the option to reconsider the current TMDLs established for Bear Creek if they are convinced that maintaining a flow of a lesser quality effluent is in the public interest. This decision would ultimately be made by the Environmental Quality Commission which oversees the operation of the DEQ.

Noncost Evaluation Summary. The preceding noncost evaluations are subjective and do not lend themselves to numerical ranking. However, the alternatives can be compared with respect to noncost criteria as shown in Table 9-13. It should be noted that the two most viable alternatives 1 and 3A compare closely; hence, neither should be excluded on the basis of noncost criteria.

9-47A
(Rev. 7/19/91)

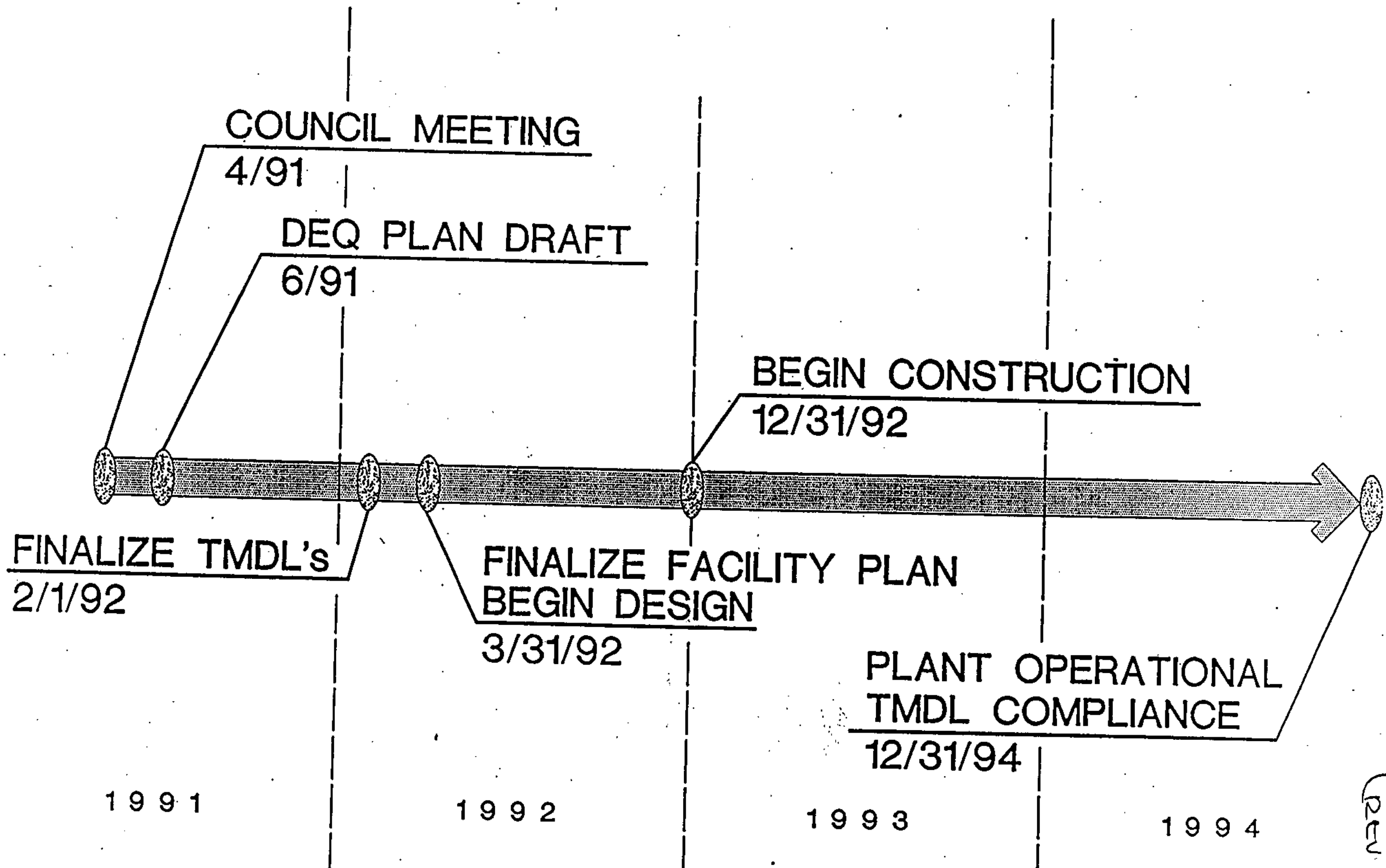
Table 9-13. Noncost Alternative Evaluation Summary

	1A - Raw Sewage to Medford	2A - Medford winter, irrigate summer	2B - Effluent to Medford	3A - Bear Creek winter, irrigate summer	3C - Bear Creek winter, Medford summer	4 - AWWTP Bear Creek year round
Engineering/Institutional						
Flexibility	-	O	O	O	+	-
Reliability	+	O	O	O	O	-
Use of existing facilities	-	+	+	+	+	O
Implementation	O	O	O	O	O	O
Environmental						
Air quality	+	+	+	+	+	O
Noise	+	+	+	+	+	O
Wetlands	O	+	O	+	+	+
Bear Creek Fisheries	?	?	?	?	?	+
Potable Water						
Ashland source	O	+	O	+	O	O
Talent source	-	-	-	-	-	+
Ashland effluent-potable	O	O	O	O	O	+

<u>RANKING SYSTEM</u>
+ = POSITIVE
- = NEGATIVE
O = NEUTRAL
? = PROBLEMATICAL

9-50 (REV 7/19/91)

FIGURE 1. ASHLAND TMDL COMPLIANCE SCHEDULE



Nan 1/21 Mtg.
~~Contract~~

Brown and Caldwell
Consultants

1025 Willamette Street
Suite 300
Eugene
Oregon 97401-3199
(503) 686-9915
FAX (503) 686-1417

July 17, 1992

Mr. Steve Hall
City of Ashland
20 East Main Street
Ashland, Oregon 97520

13-4384-10

Subject: Facilities Plan Update and Recommendations

Dear Mr. Hall:

This letter includes an update to our facilities planning efforts since our last review document, identifies remaining evaluations to be performed, and presents our recommended treatment alternative.

Facilities Plan Updated

On April 16, 1991, Brown and Caldwell submitted a wastewater facilities plan review document which presented planning information, developed alternatives, and recommended further evaluation of two alternatives: Alternative 1 which would abandon the existing Ashland Wastewater Treatment Plant and convey raw sewage to Ashland, and Alternative 3A which includes summer effluent spray irrigation and winter discharge to Bear Creek.

The Department of Environmental Quality (DEQ) granted a delay to the facilities planning schedule in August of last year to allow investigation of the potential impact to fisheries of Ashland's effluent. This information was needed to help the city select the most environmentally sound alternative and aid the DEQ in finalizing the allowable Total Mass Daily Load (TMDL) for Ashland's discharge. These TMDLs are used as the basis for determining the level of treatment required. Since that time, flow data has been collected in Bear Creek and a investigation of Bear Creek habitat and temperature effects has been conducted.

In the past year, we have refined the estimated Alternative 1 capital and annual costs to reflect Medford's recent facilities planning efforts. Meetings with Medford staff have been conducted to discuss these cost estimates. The final facilities plan draft will include a detailed discussion of the development of revised Alternative 1 costs as shown in Table 9-1.

Alternative 3A has also been refined since our last submittal. This alternative includes effluent holding at the irrigation site to equalize irrigation requirements with variable effluent flow. We have increased the size of the effluent holding lagoons to ensure that this alternative can be operated to meet the final permit requirements defined by the DEQ. Approximately six weeks of effluent storage is included to manage the discharges to Bear Creek to best protect fisheries concerns. Other costs have been added for lagoon access roads and piping. Table 9-7 provides a detailed breakdown of the revised Alternative 3A capital and annual costs.

Revised Table 9-12 summarizes the capital, annual, and present worth costs for all the alternatives that passed the initial screening. The previously mentioned cost estimate changes had a negligible effect upon the relationship of the two lowest cost alternatives. The present worth analysis shows the costs of Alternatives 1 and 3A to be essentially equal.

Remaining Evaluations

Recent discussions with the DEQ have resolved many of the water quality concerns regarding discharge of plant effluent to Bear Creek. Temperature, ammonia, and dilution are the remaining concerns. The Oregon Department of Fish and Wildlife (ODFW) will review the temperature data with assistance from Brown and Caldwell. The DEQ will then solicit a recommendation from ODFW regarding the discharge of effluent during low flow periods. Brown and Caldwell will refine our ammonia removal calculations to verify that effluent ammonia will meet the proposed discharge limits. The DEQ has stated that a waiver for their dilution rule is likely if the other discharge criteria can be met.

Recommended Alternative

Alternative 3A is the recommended alternative for the following reasons:

1. Alternative 3A shares the lowest present worth cost with Alternative 1.

2. Alternative 3A leaves Ashland's available effluent in Bear Creek for the protection of fisheries. During extreme low flow periods, Ashland's effluent constitutes a large portion of the total stream flow below Ashland Creek.

3. This alternative offers a high degree of operational flexibility. The effluent could be discharged during the fall and late winter or stored to maximize the beneficial uses for fisheries and other uses.

4. There is a significant value to the water rights which would be purchased along with the land required for effluent irrigation. This water from Emigrant Lake could be used to augment stream flows during low flows. In addition, this water could be used as a source of potable water.

5. This alternative provides the city with local control of both their wastewater treatment operations and effluent.

Summary

In our discussions with the DEQ on July 16, 1992, it was agreed that this letter appended to our April 16, 1991, facilities plan draft would meet the intent of the September 1, 1992, facilities plan deadline. We anticipate that the information from the remaining evaluations will be input into the final draft to be completed by the end of this year. This information will also be used by the DEQ in formulation of Ashland's discharge permit.

The permit process will begin concurrent with DEQ's approval of this facilities plan revision. Ashland will begin the process with a permit request which will include the following items:

1. A statement of land use capability.

2. A request for an exemption from the dilution rule.

3. A request for an extension to the 1994 compliance schedule.

This facilities planning effort has been a long and complicated process. We are nearing the end of the planning stage thanks to the continued efforts of your staff and involved city council. We are confident that the recommended alternative will provide the cost-effective environmental protection we all desire.

Very truly yours,

BROWN AND CALDWELL

John Holroyd

John Holroyd
Project Manager

JEH:ps.km

Attachments

Table 9-1. Estimated Capital and Annual Costs for Alternative 1

Item	Cost, dollars
Demolish existing plant	200,000
Conveyance to Medford	4,746,000
Medford WWTP SDC	6,858,000
BCVSA SDC	3,100,000
Subtotal	14,904,000
Contractor indirects	495,000
Subtotal	15,399,000
Contingency a	1,360,000
Subtotal	16,759,000
Engineering, administration b	1,700,000
TOTAL CAPITAL COST	18,459,000
Annual costs	
Oper and maintenance	9,000
Chemicals	2,000
Power c	0
Medford WWTP service charge d	245,000
SDCs for future users	274,000
BCVSA service charge	18,000
Administration	120,000
TOTAL ANNUAL COST	668,000

Notes:
a Contingency: 25% (0% on SDCs)
b Engr/admin: 25% (0% on SDCs)
c Power cost: $0.05 per kwh
d Service charge would increase by about $7000 per year to account for increased O&M costs and debt service incurred by improvements at the Medford WWTP

Table 9-7. Estimated Capital and Annual Costs for Alternative 3A

Item	Cost, dollars
Grit removal	12,000
Comminutors	0
Primary clarifier	58,000
Aeration tanks, existing	210,000
Aeration tank, new	784,000
Blowers (incl building)	450,000
Secondary clarifier No. 1	160,000
Secondary clarifier No. 2	10,000
Secondary clarifier No. 3	464,000
Chlorine contact	0
Chlorination/dechlorination	210,000
Chem feed/flocculation	298,000
Tertiary filter	425,000
Irrigation pumping stations	236,000
Effluent storage/irrigation system	2,146,000
Wetlands	200,000
Anaerobic digester 1 mods	148,000
Anaerobic digester 2	337,000
Digester control building	690,000
Demolish secondary digester	120,000
DAFT	250,000
FSLs	611,000
Sludge transport	262,000
Subtotal	8,081,000
Elect/instrumentation	1,362,000
Yard piping	1,339,000
Contractor indirects	973,000
Subtotal	11,755,000
Contingency a	2,939,000
Subtotal	14,694,000
Engineering, administration b	3,674,000
Subtotal	18,368,000
Land c	900,000
TOTAL CAPITAL COST	19,268,000
Annual costs	
Oper and maintenance	239,000
Chemicals	26,000
Power d	192,000
Administration	240,000
TOTAL ANNUAL COST	697,000

Notes:
a Contingency: 25%
b Engr/admin: 25%
c Land cost: $1200 per acre
d Power cost $0.05 per kwh

Table 9-12. Summary of Costs for Alternatives 1 through 4

	Alternative					
Cost Item, $1000	1	2A	2B	3A	3C	4
Capital	18,459	33,572	27,868	19,268	31,682	26,590
Annual Costs	668	1191	1132	697	1205	1009
Present worth of annual costs	6,653	11,513	10,965	6,478	11,643	9,377
Present worth of salvage value	(532)	(1,079)	(815)	(602)	(877)	(731)
Total present worth	24,580	44,006	38,018	25,144	42,448	35,236

Notes:
1 Based on discount rate of 8.75%
Based on study period of 20 years
2 Salvage value based on straight line depreciation over study period

Memorandum

August 11, 1992

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: Ashland Wastewater Plant Final Facilities Plan

ACTION REQUESTED

1. If City does not receive approval from Oregon Department of Environmental Quality on time extension for submission of Final Facilities Plan prior to August 18, 1992 meeting:

   City Council receive additional information from public and defer decision on preferred alternative until September 1, 1992 council meeting.

2. If City does receive approval for time extension:

   City Council appoint representative(s) to work with Regional Rate Committee from Council and staff and postpone action on preferred alternative until November, 1992.

BACKGROUND

The City Council held a public hearing on August 4, 1992 to receive comments on the two final alternatives for the Ashland Facilities Plan. The two alternatives are to:

> 1A. Dismantle existing Ashland Wastewater Plant and connect to the Medford Wastewater Plant through Bear Creek Valley Sanitary Authority (BCVSA) transmission facilities.
>
> 3A. Upgrade Ashland Wastewater Plant to allow winter discharge to Bear Creek and summer spray irrigation.

After hearing the testimony of several individuals, agencies and special interest groups, the Council postponed a decision on the preferred alternative until the August 18, 1992 Council meeting. The postponement was to allow staff to request final comments from other agencies and to arrange a meeting with the Regional Rate Committee (RRC) to further discuss Alternative 1A and the requirements of the RRC.

On August 10, 1992 Don Laws, Greg Williams, Brian Almquist, Paul Nolte and myself met with the RRC. I posed specific questions to the RRC which the City of Ashland needs to have answered in order to give full and reasonable consideration to Alternative 1A. The questions were:

* Will the City of Ashland become a part of the RRC or a contract agency?

* Will the RRC consider using flow as a method of computing the systems development charges (SDC's) for the Medford Wastewater Plant and the BCVSA trunk sewer facilities, rather than the number of existing connections in Ashland. Potential savings are estimated at $2.6 million.

* Will the RRC consider allowing the payment of the SDC's over a period of time, rather than all at time of connection?

* What will the format of an agreement be if Ashland joins the region through Alternative 1A?

* What are the future plans of the Medford Wastewater Plant in meeting the requirements of the Wild and Scenic designation of the Rogue River?

As a result of the meeting with the Regional Rate Committee meeting, staff has sent a request to DEQ to postpone the deadline for submission of the Final Facilities Plan from September 1, 1992 to January 1, 1993.

Because of the request for postponement, John Holroyd of Brown and Caldwell will not attend the August 18, 1992 City Council meeting but will be available for the September 1, 1992 meeting.

I am enclosing information received as of today, August 11, 1992. Rhonda Moore will include any other information received prior to the Council meeting.

COUNCIL REQUESTS

1. Are there "economies of scale" in relation to similar improvements to the Ashland or Medford Wastewater Treatment Plants. Yes-about 50%. See Holroyd letter of August 5.

2. Will Ashland have to meet water quality standards if Talent Irrigation District water is introduced into Bear Creek to offset the withdrawal of treated effluent from Ashland's plant? No-see OR DEQ letter of August 10.

3. Will DEQ grant an extension to the September 1, 1992 deadline? Maybe-see OR DEQ letter of August 10.

STAFF RECOMMENDATION

As listed in ACTION REQUESTED.

cc: Jim Olson, Acting City Administrator
Dennis Barnts, Water Quality Superintendent
Regional Rate Committee-c/o Don Walker, Public Works Director, City of Medford

encl:
Holroyd letter, 8/5/92
OR DEQ letter, 8/10/92
RVCOG letter, 8/6/92
ODFW letter, 8/7/92
J.C. Health Dept. letter, 8/10/92
Eagle Mill Farm letter, 8/12/92
Mel Winkleman letter, 8/12/92
J.C. Board of Commissioners

CC

CITY OF ASHLAND

CITY HALL
ASHLAND, OREGON 97520
telephone (code 503) 482-3211

August 11, 1992

Mr. Richard J. Nichols, Manager
Municipal Projects Section
Water Quality Division
Department of Environmental Quality
811 S.W. Sixth Avenue
Portland, Oregon 97204-1390

RE: Time Extension Request - File Number 3780
Stipulation and Final Order NPDES Permit 100302

Dear Dick:

The Ashland City Council held a public hearing to receive comments on the two final alternatives for the Ashland Facilities Plan. The two alternatives are:

1A. Dismantle existing Ashland Wastewater Plant and connect to the Medford Wastewater Plant through Bear Creek Valley Sanitary Authority (BCVSA) transmission facilites.

3A. Upgrade Ashland Wastewater Plant to allow winter discharge to Bear Creek and summer spray irrigation.

After hearing the testimony of several individuals, agencies and special interest groups, the Council postponed a decision on the preferred alternative until the August 18, 1992 Council meeting. The postponement was to allow staff to request final comments from other agencies and to arrange a meeting with the Regional Rate Committee (RRC) to further discuss Alternative 1A and the requirements of the RRC. The RRC is an appointed body that represents the five entities using the Medford Wastewater Plant, including the cities of Phoenix, Medford, Central Point and Jacksonville and BCVSA. RRC's primary focus is in relation to rates, systems development charges and capital improvements for the Medford Wastewater Plant and BCVSA facilities.

On August 10, 1992 two City Councilors, the City Administrator, City Attorney and myself met with the RRC. I posed specific questions to the RRC which the City of Ashland needs to have answered in order to give full and reasonable consideration to Alternative 1A. The questions were:

* Will the City of Ashland become a part of the RRC or a contract agency?

* Will the RRC consider using flow as a method of computing the systems development charges (SDC's) for the Medford Wastewater Plant and the BCVSA trunk sewer facilities rather than the number of existing connections in Ashland. Potential savings are estimated at $2.6 million.

* Will the RRC consider allowing the payment of the SDC's over a period of time, rather than all at time of connection?

* What will the format of an agreement be if Ashland joins the region through Alternative 1A?

* What are the future plans of the Medford Wastewater Plant in meeting the requirements of the Wild and Scenic designation of the Rogue River?

Each of the members of the RRC indicated they would have to discuss the requests with their individual political bodies prior to offering any comments on Ashland's requests.

Because of these issues, the City of Ashland is requesting an extension of the final facilities plan report (FPR) due date from September 1, 1992 to January 1, 1992 to allow adequate time to investigate the issues outlined above. The submission date is stipulated in the NPDES permit and SFO. The RRC voted unanimously to support Ashland's request for a time extension for the submittal of the FPR. A letter will be forwarded under separate cover from the FPR.

If possible, it would be extremely helpful to have your response, even if preliminary, prior to the August 18, 1992 City Council meeting. I will be on vacation and the correspondence should be forwarded to:

Brian Almquist
City Administrator
City of Ashland
20 East Main Street
Ashland, Oregon 97520
Telephone: 482-3211
Fax: 488-5311

Thank you for your assistance.

Sincerely yours,

Steven M. Hall, P.E.
Public Works Director

SMH:rm\PW\Nichols.Sew

cc: Brian Almquist, City Administrator
Mayor and City Council
Dennis Belsky, DEQ, Medford
Regional Rate Committee-
c/o Don Walker, Public Works Director, City of Medford
Jim Olson, Acting Public Works Director
Dennis Barnts, Water Quality Superintendent

cc

CITY OF ASHLAND

CITY HALL

ASHLAND, OREGON 97520
telephone (code 503) 482-3211

August 11, 1992

Regional Rate Committe
c/o Donald Walker, P.E.
Public Works Director
City of Medford
411 West 8th Street
Medford, Oregon 97502

Dear Don:

I wish to thank the Regional Rate Committee for their support of Ashland's request to extend our facilities plan submission date with the Oregon Department of Environmental Quality. Ashland is requesting an extension from September 1, 1992 to January 1, 1993. Richard Santner of DEQ indicated that Ashland has a reasonable chance of receiving approval of the time extension.

This letter is a formal request for the Regional Rate Committee to respond to the following conditions proposed by the City of Ashland in relation to the potential joining of the regional facilities.
The City of Ashland requests that:

1. Ashland would be a member of the Regional Rate Committee as equal with the existing five members.

2. Ashland's SDC's for the Medford Wastewater Plant be based on flow rather than individual existing connections. Your preliminary analysis incates a saving of about $2.6 million by using flow rather than connections.

3. The Bear Creek Valley Sanitary Authority SDC's be clarified and reductions be considered by BCVSA similar to those indicated by Medford.

4. The City of Ashland be granted permission to pay the SDC's over a period of time, possibly five to ten years.

5. The City of Ashland be furnished a sample agreement for joining the region for review by Ashland.

6. The City of Ashland be furnished the bylaws and/or rules of the Regional Rate Committee.

Because of the time constraints, the City of Ashland would like to have commitments from the Regional Rate Committee within the next 60 days, if possible.

I will be out of town from August 12 through Labor Day. In that period of time, would you please forward all correspondence to Brian Almquist, City Administrator.

As requested by the Regional Rate Committee, I am attaching information from Ashland's Facility Plan in relation to the two options under consideration by the Ashland City Council.

Sincerely yours,

Steven M. Hall, P.E.
Public Works Director

SMH:rm\PW\Walker.Sew

cc: Brian Almquist, City Administrator
Mayor and City Council
Jim Olson, Acting Public Works Director
Dennis Barnts, Water Quality Superintendent

encl: Alternates 1A and 3A Information

Brown and Caldwell
Consultants

1025 Willamette Street
Suite 300
Eugene
Oregon 97401-3199
(503) 686-9915
FAX (503) 686-1417

CITY OF ASHLAND
RECEIVED
DATE AUG 08 1992

August 5, 1992

Mr. Steve Hall
City of Ashland
Public Works Director
20 East Main Street
Ashland, Oregon 97520

13-4384-42

Subject: Information Requested at July 21, 1992, Council Meeting

Dear Mr. Hall:

Supplemental information regarding Alternatives 1 and 3A was requested at the July 15, 1992, council meeting. This letter provides our response to the following questions:

1. Will the Department of Environmental Quality (DEQ) have jurisdiction over flow augmentation water releases from Emigrant Lake?

   Our contacts with Mr. Dick Nichols, Manager of the Municipal Projects Section of the DEQ, indicate that the DEQ would have no permitting or regulatory involvement in such a water release. The city has asked for written verification of this position.

2. What would be the quantity of water available for flow augmentation from lands purchased for effluent irrigation?

   Pages 9-17 of our April 13, 1991, facility plan draft explains that the land under consideration has 2.65 acre-per-acre of water rights assigned to it. We suggested a total of 750 acres be acquired. This equates to about 650 million gallons (mg) per year. The city is currently investigating how much of this water would be available for flow augmentation. If all of the 650 mg is available, this would equate to the volume of effluent discharged annually to Bear Creek by the Ashland Wastewater Treatment Plant.

   If only half this volume were available, this would still make a major contribution during low flow periods. For example, if 325 mg were discharged over a period of three months, this would contribute an average of 3.6 million gallons per day (mgd) during low stream flow periods when the combined Bear Creek and plant effluent flow routinely drops to 5 mgd. In this case, flow augmentation could increase the water available to fisheries by over 70 percent during this period.

3. Would economies of scale mean that a subsequent expansion would be less expensive at the larger Medford Wastewater Treatment Plant compared to the Ashland plant?

   Historically, this has been a reasonable assumption. We reviewed the record of the cost of recent treatment plant expansions. The average expansion cost for an advanced secondary treatment capacity for a plant the size of Ashland was approximately 50 percent higher than for a plant the size of Medford. This information may be of limited value however, since the actual permit requirements will have a dominating influence on the cost of plant expansion. For instance, meeting the Alternative 4 phosphorus limit in Bear Creek would increase Alternative 3C treatment costs by over 40 percent. Predicting future permit limits on either the Rogue or Bear Creeks would be a very difficult task.

Please call if there is further information we may provide prior to the August 18 council meeting.

Very truly yours,

BROWN AND CALDWELL

John Holroyd

John Holroyd
Project Manager

JEH:ps.km

CC - Council 9/18 CM

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

August 10, 1992

Mr. Steven M. Hall, P.E.
Public Works Director
City of Ashland
City Hall
Ashland, OR 97520

Re: Ashland Facilities Plan

Dear Mr. Hall:

We are in receipt of your letter of July 27, 1992 in which you pose two questions pertaining to Alternative 1A (abandon Ashland WWTP; connect to Medford WWTP) of the draft facilities plan. Your questions are restated below with our answers.

"Additional time will be required to explore several issues with the Regional Rate Committee in relation to institutional arrangements and connection costs (systems development charges, etc.). Will DEQ be amenable to granting a time extension to explore these issues?"

The City's NPDES Permit and the Stipulation and Final Order (SFO) of 2/7/92 both require that a facilities plan be submitted by September 1, 1992. In the interest of identifying the alternative that best protects water quality in Bear Creek and is also cost-effective, the Department is prepared to consider a formal request by the City for an extension of the facilities plan due date.

In accordance with the Schedule C, Paragraph 3 of the Permit and Paragraph 11 of the SFO, the request for a time extension must state why an extension is needed and what activities will be undertaken during the additional time, and specify a new requested due date.

However, please bear in mind that until we complete the formal steps needed to modify the Permit/SFO due date for the facilities plan, it remains September 1. If the City becomes certain that it wants an extension, it must make a request for one very soon.

811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696

"The question arose as to the requirements of DEQ if the City of Ashland acquired Talent Irrigation stored water rights to release from Emmigrant Lake to offset the removal of Ashland"s effluent from Bear Creek. Will DEQ apply the same or similar water quality rules as the Ashland WWTP? Will DEQ require the water to be under the storm drainage permitting system potentially requiring pretreatment?"

The water in Emmigrant Lake is a water of the state. It is neither a "waste" subject to an NPDES waste discharge permit (OAR 340-45), nor storm drainage subject to an NPDES permit (40 CFR 122-124).

The City of Ashland will not need a waste discharge permit, waste load allocation, or load allocation to release water from Emigrant Lake.

I hope our responses will assist the Council in deciding upon its course of action. Please do not hesitate to contact Dick Nichols at 229-5323 if you have any additional questions.

Sincerely,

for Lydia R. Taylor
Administrator
Water Quality Division

LRT:RN:crw
MW\WC10\WC10528.5
cc: John Holroyd - Brown and Caldwell
Dennis Belsky - DEQ
Dick Nichols/Source File
Baumgartner - DEQ
Olivia Clark - DEQ

ROGUE VALLEY
Council of Governments

155 S. Second Street
P.O. Box 3275
Central Point, OR 97502

503-664-6674

8/7/92

August 6, 1992

Mr. Steve Hall
Public Works Director
City Hall
20 East Main Street
Ashland, OR 97520

Subject: Comments on Proposed Sewage Treatment Alternatives for Ashland

Dear Steve:

Thank you for the opportunity to comment on the two remaining alternatives available to Ashland for meeting nutrient loading limits on Bear Creek discharges. This is only a staff response since the full Rogue Valley Council of Governments has not met to review the alternatives to form an official RVCOG response.

The RVCOG Water Quality effort currently emphasizes the need for more flow in Bear Creek to meet both out-of-stream and in-stream demands. When serious water quality improvement implementation began in the late 1970's, the highest priorities were to reduce bacteria and sediment levels and to decrease water temperatures. The cooperative efforts of all non-point sources were so successful that Bear Creek showed significant reductions in these pollution problems.

The cooperative effort among local agencies to meet new nutrient (TMDL) standards for Bear Creek represents one of the highest priority water quality problems for this artificially flow enhanced stream.

However, recent information about the possible adverse impact of low flows has shown that water quality <u>has</u> degraded with lower flows, and that the drought is having an unusually severe impact on virtually all water quality parameters.

Of particular concern is the <u>high temperatures</u> recorded for Bear Creek during the last several years. There is a logical correlation between low flows and higher summer temperatures and the impact on a once viable salmonid habitat has been significant. The attached Executive Summary for the Bear Creek Habitat and Temperature Study (1992) done jointly by the U.S. Forest Service, Fish & Wildlife, and RVCOG, indicates the severity of the low flow/high temperature problem.

In summary, RVCOG staff believes it is critical to keep as much water in Bear Creek as possible. The loss of 3 cubic feet per second of flow could be more harmful during certain times of the year than the water problems resulting from current nutrient loadings. Therefore, whichever alternative is selected, we think it is imperative that Ashland implement some mechanism by which the loss of effluent flow is somehow replaced in Bear Creek. Ideally, this flow augmentation could be "saved" for release during the critical October-November period. Such flow release timing could help solve the dilution problems for winter discharges, thereby providing Ashland the opportunity to choose alternative 3A.

RVCOG staff very much appreciates the care and deliberation Ashland staff and Council are taking in preparation for this important decision. Thank you again for this opportunity to comment.

Sincerely,

Eric Dittmer

Eric Dittmer
Water Quality Coordinator

Marc Prevost
Water Quality Coordinator

enc.

BEAR CREEK HABITAT
and
TEMPERATURE STUDY
1990-91

A Cooperative Study

- **Oregon Department of Fish and Wildlife - Jeff Dambacher**
- **Rogue River National Forest - Randy Frick**
- **Rogue Valley Council of Governments - Eric Dittmer**

Special Assistance:

Rogue Flyfishers

Crater High School

Rogue River Valley Irrigation District

May 1992

BEAR CREEK HABITAT and TEMPERATURE INVESTIGATION

Executive Summary

This paper summarizes the results of a temperature and habitat investigation of Bear Creek and its tributaries during the summers of 1990 and 1991. This was a cooperative effort among Oregon Department of Fish and Wildlife, Rogue River National Forest, Rogue Valley Council of Governments, Rogue Flyfishers, and Crater High School.

The temperature investigation found:

* Temperatures in lower Bear Creek approaching 80°F.
* Temperatures in tributaries exceeding 80°F.
* Bear Creek temperatures increase downstream
* Bear Creek Temperatures strongly controlled by solar input
* Bear Creek Temperature maximum occurred in late July

The habitat investigation found:

* Salmonids exist in Bear Creek only upstream of an area half-way between Phoenix and Medford.
* Black crappie and redside shiner exist downstream from Talent and are <u>not</u> native to Bear Creek.
* No steelhead were found in areas where temperatures exceeded 75°F.

The conclusions of the study include:

* High water temperature is likely the single most important factor limiting production of salmonids in Bear Creek.
* Summer artificial flow regimes vary flow amounts considerably and therefore disrupt natural habitat patterns.
* Bear Creek has less than ideal stream channel diversity and tree cover.
* Tributary flow and irrigation return flows do little to lower Bear Creek temperatures.
* The warm unnatural conditions of Bear Creek have allowed redside shiner to out-compete and replace salmonids.
* Low flow situations increase the potential for excessive temperature.

Oregon

DEPARTMENT OF
FISH AND
WILDLIFE

ROGUE DISTRICT
OFFICE

August 7, 1992

Steve Hall
Public Works Director
City of Ashland
City Hall
Ashland, OR 97520

Dear Steve:

These comments are in response to the evaluation of alternatives for upgrading the Ashland Wastewater Plant.

A 1991 study on Bear Creek found that salmonid (salmon, steel-head and trout) rearing is confined to the upper part of Bear Creek, primarily above Phoenix, during the summer months due to warm water temperatures. Water temperatures are impacted by water volume. A reduction in water flow will exacerbate the temperature problem and probably further limit habitat for sal-monid rearing.

I recommend that every effort be made to maintain or enhance water flows as much as possible in Bear Creek. Water quality is also critical, but it has improved measurable in recent years. It is my feeling that water temperatures and not water quality is the primary limiting factor to salmonid populations in Bear Creek.

I hope these comments will help in the decision making. If I can be of further service, please let me know.

Sincerely,

Jerry MacLeod (sha)

Jerry MacLeod
District Fish Biologist

5286 Table Rock Road
Central Point, OR 97502
(503) 776-6170
FAX (503) 776-6194

CC-Council 8/18/92

JACKSON COUNTY, OREGON
1005 E. MAIN STREET, MEDFORD, OREGON 97504

HEALTH AND HUMAN
SERVICES DEPARTMENT

RECEIVED

DATE AUG 14 1992

August 10, 1992

Steven M. Hall, Public Works Director P.E.
City of Ashland
City Hall
20 E. Main
Ashland, Or. 97520

Dear Steve,

Thank you for the opportunity to comment on Ashland's proposals for the waste water treatment facilities.

Our comments are not intended to be an in depth review of the alternatives or look into a long term analysis of the impacts. They are instead, centered around the issues of poor water quality and high nutrient loads in Bear Creek and the potential for upset conditions, etc. which would adversely affect the water quality of Bear Creek and affect downstream water users. We therefore would request, that any alternative be reviewed in this light.

We would hope that if the present effluent flows discharged through Ashland Creek and Bear Creek, are eliminated, that alternative flows be replaced to maintain stream flows and water quality. As you know, in these times of low stream flows in Bear Creek, water quality deteriorates rapidly due to higher temperatures and increased nutrient and bacteria loading. This will also directly affect the water quality of the raw water for Talent's water treatment facility.

It appears that the ideal would be to utilize Ashland's effluent for land application and then transfer water rights from other properties at the equivalent flow of the present discharge rate to Bear Creek, which would maintain flows and improve water quality.

Clearly it appears to be a difficult decision. Trying to meet the new D.E.Q./E.P.A. discharge requirements and look at the costs of treatment, maintaining stream flows, and all of the other complicating issues, almost requires a crystal ball.

If you have any questions concerning our comments, please feel free to call.

Sincerely,

Gary K. Stevens

Gary K. Stevens, R.S.
Manager, Environmental Health Services

GKS:jb

cc: Hank Collins, Director-Health and Human Services

Eric Dittmer

7058

Eagle Mill Farm

Organic Produce
100 Eagle Mill Rd., Ashland, Oregon 97520

To: Ashland City Council 8-12-92

We at Eagle Mill farm are concerned about the City's proposal to remove water from Bear Creek as a solution to our Waste Water Treatment Problem, We feel that inadequate consideration has been given to the senior water rights of down stream irrigators. See enclosed certificate of our water right.

What needs to happen now is two fold

① The City needs to negotiate an extension of the Sept 1, 1992 DEQ Imposed dead line.

② The City need to invite <u>ALL</u> interested and affected parties to a series of meetings to work out a big picture solution to Bear Creeks Problems. Eagle Mill farm Partner Ron Roth hearby volunteers to be part of that committee.

Sincerely, Eagle Mill farm Partners

Ronald E Roth Russell E Dale Mark Rosenkrans

Kathleen MacMichael [illegible]

Court-1M-12-43

Permit No. ... Cert. No. 55021

STATE OF OREGON

COUNTY OF JACKSON

EAGLE MILL FARM WATER RIGH

CERTIFICATE OF WATER RIGHT

This Is to Certify, *That* W. T. Bostwick

of Ashland *, State of* Oregon *, has a right to the use of*

the waters of Bear Creek, a tributary of Rogue River

for the purpose of irrigation of 13 acres, and domestic use

and that said right has been confirmed by decree of the Circuit Court of the State of Oregon for Jackson *County, and the said decree entered of record at Salem, in the Order Record of the STATE ENGINEER, in Volume* 4 *, at page* 1 *; that the priority of the right thereby confirmed dates from* 1860;

that the amount of water to which such right is entitled, for the purposes aforesaid, is limited to an amount actually beneficially used for said purposes, and shall not exceed 0.17 cubic foot per second.

A description of the lands irrigated under such right, and to which the water is appurtenant (or, if for other purposes, the place where such water is put to beneficial use), is as follows:

8 acres in SW¼ SE¼
5 acres in SE¼ SE¼
Section 32,
T. 38 S., R. 1 E., W. M.

And said right shall be subject to all other conditions and limitations contained in said decree.

The right to the use of the water for the purposes aforesaid is restricted to the lands or place of use herein described.

WITNESS the signature of the State Engineer, affixed

this 30 *day of* September *,* 1949.

EXHIBIT "A" CHAS. E. STRICKLIN

State Engineer

cc - Council 8/18
[illegible]

BEAR CREEK VALLEY SANITARY AUTHORITY

PHONE (503) 779-4144 • 3915 SOUTH PACIFIC HWY. • MEDFORD, OREGON 97501

CITY OF ASHLAND
RECEIVED
DATE AUG 14 1992

August 12, 1992

Steve Hall
Public Works Director
City of Ashland
20 E. Main
Ashland, OR 97520

Dear Steve:

Since my Board has not had an opportunity to discuss your letter, I can not speak for BCVSA. However, your council has a difficult decision to make, and you did ask for my opinions. . .

1. Will Ashland be able to join as a member agency? This request seems very reasonable.

2. Are the Regional SDCs negotiable? To my knowledge the Region has never negotiated SDCs. However, our policy calls for the Technical Committee to determine rates for large commercial users. Therefore, I believe that a large "buy in" would need to be examined by the Committee. I would support a figure based on total flow. Thus, SDCs and/or "buy in" charges would be based directly on additional capacity needs for the City of Ashland for both the regional treatment plant and the interceptor system.

   BCVSA's SDC is called a Collection System Reimbursement fee. Since you would not be part of our collection system, the fee would not apply.

3. Observations on the two final options. I believe that the two City Councilors at Monday's Regional meeting did a good job of discussing important issues, i.e. protecting the fish in Bear Creek, determining exactly what DEQ is requiring, increasing the amount of potable water for Ashland (I would add--and for Talent), and total cost. I would hope that total cost would include cost for Ashland as well as the Region as a whole. Don Walker mentioned that your consultant's report included money for the Region's eventual switch to third stage treatment. If Ashland decides to build its own, then the citizens of the area may pay twice for similar treatment facilities. Also, I believe that the Regional approach provides a solution that may last two or three times longer than alternative 3A.

My Board has said many times that they are interested in working cooperatively with other local governments, that major infrastructure services are best supplied by regional agencies or through cooperative ventures, and that we wish to be good neighbors. Therefore, we are willing to assist you in any way we can.

Hopefully these comments will be of help.

Sincerely,

Chuck Root
Manager

CR/cb

L211-2

cc: Brian Almquist, City Administrator

PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION

CITY OF MEDFORD
411 WEST 8TH STREET
MEDFORD, OREGON 97501

TELEPHONE
(503) 770-4520

August 12, 1992

Brian Almquist, City Administrator
City of Ashland
20 E. Main St.
Ashland, OR 97520

Subject: Ashland Sewage Treatment Plant, re: Joining the Region

As you know, Ashland has been in the process of facility planning to determine the best course of action with regards to the future process for sewage treatment. The latest step in that process pared down the options to (1) joining the region (going to the Medford WQCP), or (2) upgrading the process plus spray irrigating in the summer and discharge into Bear Creek in the winter. Medford staff at the WQCP has been active in providing background data for option (1).

In order for Ashland to join the Region, they need to tender a formal request which would be considered by the Regional Committee. If they act favorably on the request, it would be necessary for each member agency's board or commission to ratify a change to the existing regional agreement that would allow a new member. As there are five member agencies, this action could well take 2-3 months to complete from the date of request.

As of today, we understand that Ashland has not been able to present the water quality implications for Bear Creek to the Regional Committee because of conflicts between State agencies that would determine those impacts. The Committee and Ashland both need to know what impacts their actions will cause and/or solve before they can make a decision.

The Regional Committee would support a request of time extension by Ashland to the DEQ for submittal of their final decision of which option to choose for sewage treatment. A six month period should be minimum considered adequate for this purpose.

Sincerely,

Mel Winkleman

Mel Winkleman, Chairman
Regional Committee

DW:js

c: DEQ

CC - Council 8/18/92
AN

JACKSON COUNTY OREGON

10 S. OAKDALE • MEDFORD, OREGON 97501

BOARD OF
COUNTY COMMISSIONERS
Ric Holt 776-7234
Hank Henry 776-7235
Sue Kupillas 776-7236

CITY OF ASHLAND
RECEIVED
DATE AUG 14 1992

August 12, 1992

Steven M. Hall, P.E.
Public Works Director
Ashland City Hall
Ashland, OR 97520

RE: Upgrade of the Ashland Wastewater Treatment Plant

Dear Steven:

Thank you for giving Jackson County the opportunity to comment on the proposed upgrade of the Ashland Wastewater Treatment Plant. We were unable to respond by August 10th as we did not receive your letter until August 5th and a weekend intervened.

Jackson County has two principal concerns in this matter:

1. To avoid - or at least minimize - any adverse impacts on land use patterns and practices; and

2. Preserve and enhance water quality and quantity in Bear Creek.

While both of the alternatives now under consideration will result in water quality improvement in Bear Creek during the summer months, the removal of Ashland's effluent from the stream during low-flow periods is a matter of some concern. Unless steps are taken to compensate for this reduction in stream flow, adverse impacts on Bear Creek and downstream water users should be expected.

From a land use perspective, Alternative 1 (piping raw sewage to the Medford Wastewater Treatment Plant) would have little or no impact. However, Alternative 3A (discharge of treated effluent to Bear Creek during the winter; effluent irrigation in summer) would require a lengthy and probably controversial approval process. Most land across I-5 from the treatment plant (where the effluent lagoon and irrigation system would most likely be located) is zoned Exclusive Farm Use. Approval of a Conditional Use Permit (CUP) would be required for the proposed irrigation facility. The current application fee is $350. Processing the CUP application will require approximately four months, provided there is no significant opposition. Due to the nature of this facility, some public opposition should be anticipated. The current state and county land use decision process offers ample means of appeal (with corresponding expense and delay) to a determined opponent. If Alternative 3A is chosen, the possibility of procedure delays in the land use approval process should be incorporated into any projected timelines.

Thank you again for the opportunity to comment on these proposals.

Sincerely,

Sue Kupillas

Sue Kupillas, Chair
Jackson County Board of Commissioners

BP/prr

Memorandum

November 13, 1992

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: Research Project Proposal - U.S. Bureau of Reclamation

ACTION REQUESTED

City Council authorize Public Works Director to supply information requested and participate in research project.

BACKGROUND

Montie McClendon and Hap Boyer of the Boise, Idaho office of the U.S. Bureau of Reclamation have worked with the Talent Irrigation District and the City of Ashland towards an agreement for the commingling of TID irrigation water and reclaimed water from the Ashland wastewater treatment plant for over a year.

About a month ago, Montie contacted me to see if Ashland would be interested in the project proposed in the attached letter. I indicated my support but noted that the City Council would have to approve Ashland's participation.

This research project has the possibility of putting Ashland even more in the "limelight" as a leader in innovative ideas and concern for the environment. Quite frankly, I am excited about the possibilities of our being the selected city for this research.

If the research establishes parameters for the use of reclaimed water on various crops, it will allow Ashland one other method of constructively using reclaimed water in the Rogue Valley.

At this point in time, I don't believe the City of Ashland should commit to financial participation other than staff time required to complete the project.

You will note that the due date is November 20, 1992 which will be tough to meet. I intend on talking to TID and orchardists in the area to see if we have any willing participants.

Staff recommends approval of request.

SMH:rm\PW\USBR.pro

cc: Dennis Barnts, Water Quality Superintendent
Jim Olson, Assistant City Engineer
Pam Barlow, Administrative Assistant
Jill Turner, Finance Director

encl: USBR letter

United States Department of the Interior

TAKE PRIDE IN AMERICA

BUREAU OF RECLAMATION
Pacific Northwest Region
Federal Building & U.S. Courthouse
Box 043-550 West Fort Street
Boise, Idaho 83724-0043

IN REPLY REFER TO:

PN-154

NOV 05 1992

NOV 02 1992

Mr. Steve Hall, P.E.
City Engineer
City of Ashland
20 East Main
Ashland OR 97520

Subject: Proposed Research - Agricultural Use of Discharge Water From Municipal Sewage Treatment Plants (Water Quality)

Dear Mr. Hall:

Thank you for visiting with Mr. Monte McClendon of this office regarding the possible use of water from your sewage treatment facility. We are considering a research proposal with Florida A&M University where they will intentionally irrigate various food crops with water discharged from a municipal sewage treatment plant. Our goal is to determine if the reuse of this type of water has harmful residual pathogens or chemicals on the produce.

We are considering several different treatment plant facilities for the research and must evaluate each facility. The best facility can then be selected and we can proceed with the necessary agreements to start the research. In order for us to evaluate your Rock Creek facility we request information on the following items:

1. A narrative on the makeup of the types of water discharges into the facility. We are particularly interested in the amounts and types of industrial uses in the area.

2. A description of the water treatment plant (with layout and area map). Please show any areas on the facility grounds where garden size study plots could be located.

3. Water quality data for the discharged water.

4. The names, addresses, and phone numbers of local irrigation districts which are willing to participate in the effort.

5. A list of crops grown in the area which might be selected for irrigation.

6. The names of any farmers you suggest may be willing to cooperate on the project. Include the crops they grow (if known) and the distance from the treatment plant.

7. The extent your company is willing to participate with the research. Include information on any possible financial contributions.

8. A description of any known or potential environmental impacts, issues, or concerns that might arise as a result of using the proposed facilities and related lands in the study project.

9. Other information which may be helpful to this project.

We appreciate your willingness to participate on this effort. Please provide this information to our office by November 20, 1992. If you have any questions, please contact Monte McClendon, Chief, Hazardous Materials Branch, at (208) 334-1880.

Sincerely,

Douglas J. James

Regional Environmental Officer

cc: Dr. Y. P. Hsieh
Project Leader
Wetland Ecology Program
Florida A&M University
Tallahassee FL 32207

Memorandum

November 12, 1992

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: Ashland Wastewater Plant - Facilities Plan Selection

ACTION REQUESTED

City Council select preferred alternative and direct staff to finalize and submit the Ashland Facilities Plan to the Department of Environmental Quality (DEQ) before January 1, 1993, as required by the DEQ Stipulation and Final Order.

BACKGROUND

This selection of the preferred alternative to meet DEQ standards is the culmination of several years of intense activity.

April 1, 1989	City Council adopted the Draft Program Plan
July 21, 1989	The Oregon Environmental Quality Commission (EQC) established standards for the City of Ashland
September 29, 1990	EQC approved Ashland's Program Plan
December 17, 1990	City Council's first review of proposed Ashland Facilities Plan
April 16, 1991	City Council's second review of the proposed Ashland Facilities Plan. Options were reduced from nine to two
August 14, 1992	City Council public hearing on the two preferred alternatives

October 22, 1992	City Council adopted policy requiring a more detailed analysis of constructed wetlands (copy attached)
November 10, 1992	City Council met with DEQ staff to discuss the process and laws pertaining to EQC standards

The City Council is currently considering three options.

<u>OPTION 1A</u> Abandon Ashland wastewater treatment plant, construct pump station and pipeline to Phoenix area and discharge raw sewage to Medford wastewater treatment plant. Attached is a letter from the Regional Committee responding to questions posed by the City of Ashland.

<u>OPTION 3A</u> Construct major modifications to Ashland wastewater treatment plant and a small wetland. Winter discharge will be to Bear Creek and summer discharge for irrigation on City-owned land. Use acquired stored water rights to supplement Bear Creek during summer months.

<u>OPTION 3A (ALTERNATE)</u> Combine an improved Ashland wastewater treatment plant with an expanded constructed wetland. Winter discharge will be to Bear Creek. Summer discharge would be to the Talent Irrigation District (TID) canal with a trade for TID water in an equal amount to be left in Bear Creek during the summer months. This option will be investigated by an engineering consultant to be selected within the next 45 days. Study is estimated to take 4 months.

It is readily apparent that any changes to the EQC standards for the City of Ashland will be extremely difficult, if not impossible.

With the City Council goals and the understanding of the DEQ/EQC standards, it becomes evident that Ashland's chances of receiving a time extension for the constructed wetlands study will be rather slight.

Another key element which I wish to stress is Ashland's ability to meet the total maximum daily loads (TMDLs) established by the EQC by December 31, 1994. It is possible to meet that time frame with Option 1A but not by options 3A or 3A (Alternate). I have attached a schedule provided by Brown and Caldwell indicating the time frames needed to accomplish Ashland's project. You will note that option 3A will require a one year extension by the EQC for Ashland to meet established standards. This time chart assumes that a decision is made by the Ashland City Council on November 17, 1992 and the design of the selected alternative commence by March, 1993. If any actions or delays occur, the time frame will be compressed which will escalate the costs of engineering and construction.

PROPOSED ACTION

Staff is suggesting that the City Council adopt option 3A as the preferred alternative with two options for final disposition and treatment of the wastewater. This would include option 3A as proposed and 3A (Alternate) with expanded wetlands. The alternate could also include less or different modifications to the Ashland wastewater plant.

Additional conditions could be:

Resolution of issues between DEQ and Oregon Department of Fish and Wildlife

Resolution of issues with TID on replacement water.

Finding a reliable source of water to replace the "reclaimed" water removed from Bear Creek.

Final refinement and decision as to option 3A or 3A (Alternate) to be made after constructed wetlands option is completed.

Resolution of downstream water rights issues.

This would allow Ashland to meet the current deadline for submission to DEQ before January 1, 1993.

Brown and Caldwell will need time to complete the facilities plan in preparation for submission to DEQ.

SMH:rm\PW\TMDLHrg.mem

cc: John Holroyd, Brown and Caldwell
Gary Schrodt, Ashalnd Wetlands Coalition
Dennis Barnts, Water Quality Superintendent
Richard Santner, DEQ
Don Walker, Public Works Director, Medford
Chuck Root, Manager, BCVSA
Hollie Cannon, Manager, TID

encl: Council Goals
Option 1A
Option 3A
Option 3A (Alternate)
Time Schedule
Regional Committee letter

CITY OF ASHLAND

WASTEWATER TREATMENT PLANT

GOALS AND OBJECTIVES*

Adopted by the City Council

October 22, 1992

Revised/reconfirmed November 3, 1992

GOALS

The Ashland City Council requires the Ashland Facilites Plan to:

1. *Satisfy Oregon Department of Environmental Quality (DEQ) standards for effluent from the Ashland Wastewater Treatment Plant (WWTP);*
2. *Replace the volume of WWTP effluent removed from Bear Creek;*
3. *Support the natural ecology of Bear Creek; and*
4. *Minimize capital and operating costs of the WWTP.*

STATEMENT OF GENERAL INTENTION

The Ashland City Council will give full consideration to the possible use of multiple objective open surface wetlands technology to assist in achieving the WWTP goals.

MINIMUM OBJECTIVE

The Ashland City Council will determine whether the use of expanded open surface wetlands technology in conjunction with the Ashland Facilities Plan Alternative 3A might produce effluent which could be delivered to the Talent Irrigation District (TID) in exchange for Bear Creek water during summer months, thereby:

1. *Maintaining summer water flow levels in Bear Creek, and*
2. *Eliminating the need to establish and maintain the effluent irrigation system proposed in Alternative 3A.*

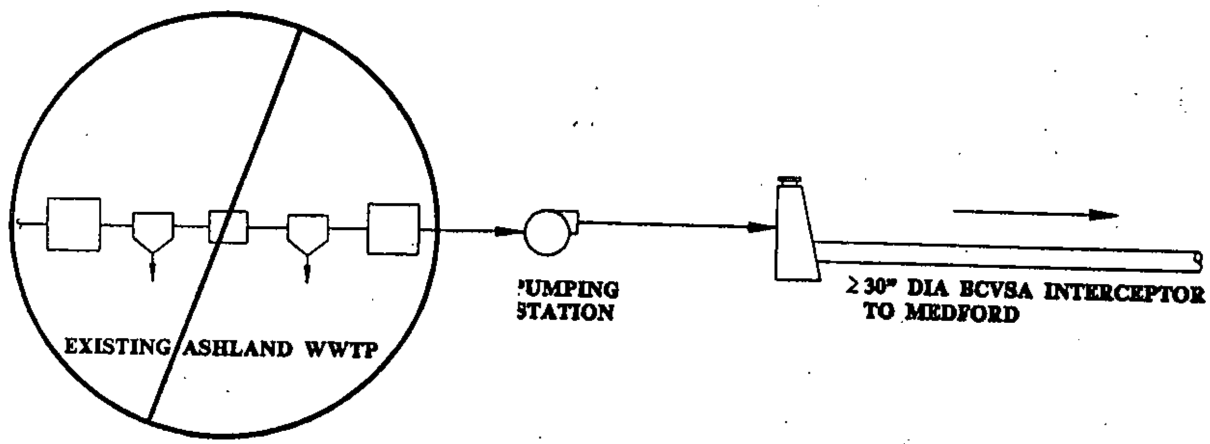
ACTION ITEMS

The City Council will take the following specific actions to facilitate the achievement of the WWTP Goals by:

1. *Undertaking a program of public education which will encourage voluntary activities to reduce the level of phosphates introduced into the the WWTP; and*
2. *Promptly obtain and fund a study to determine the feasibility of using multiple objective open surface wetlands to achieve the WWTP Goals.*

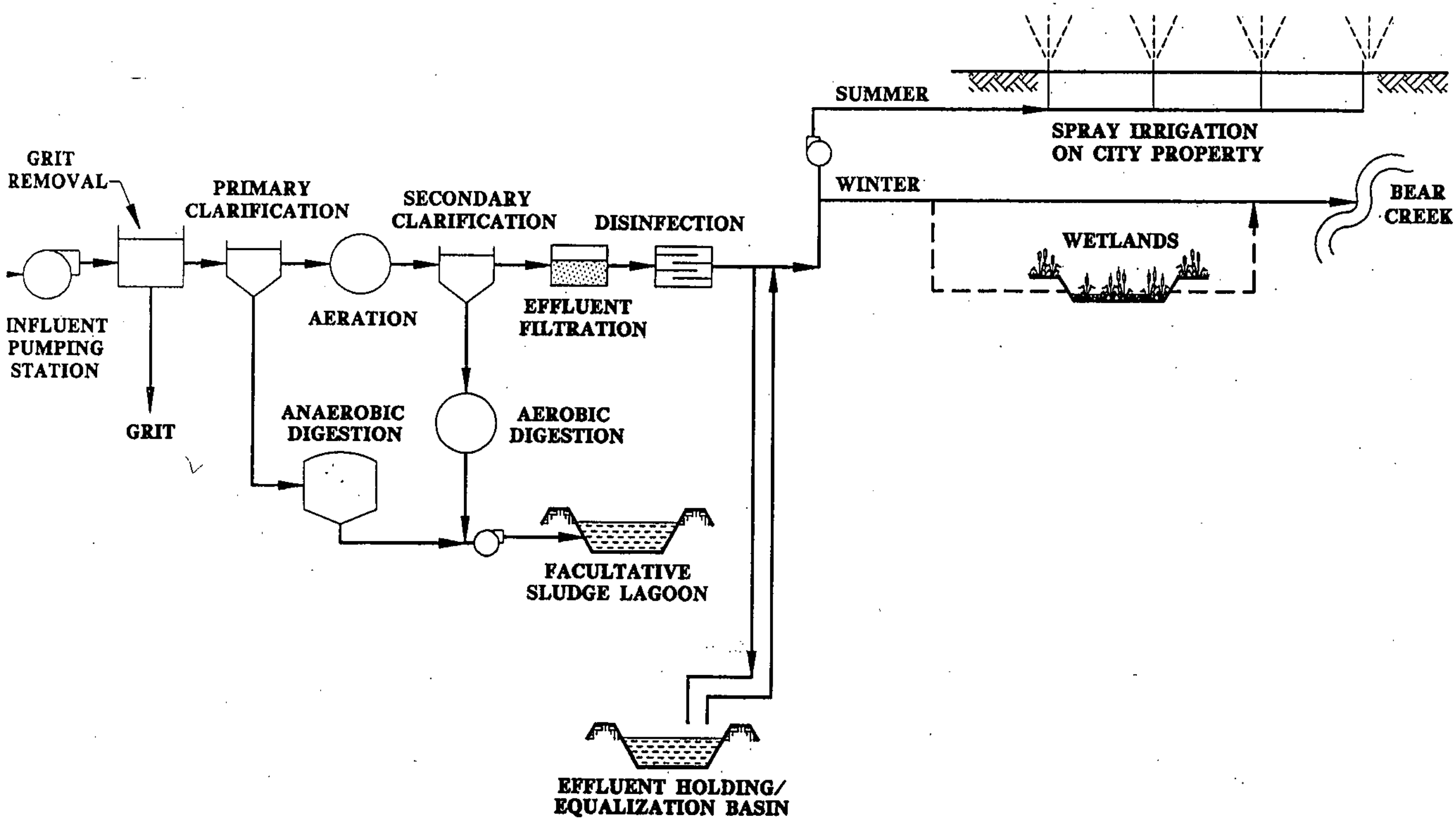
ALTERNATE 1A

SHIP RAW SEWAGE TO MEDFORD VIA BCVSA TRUNKLINE

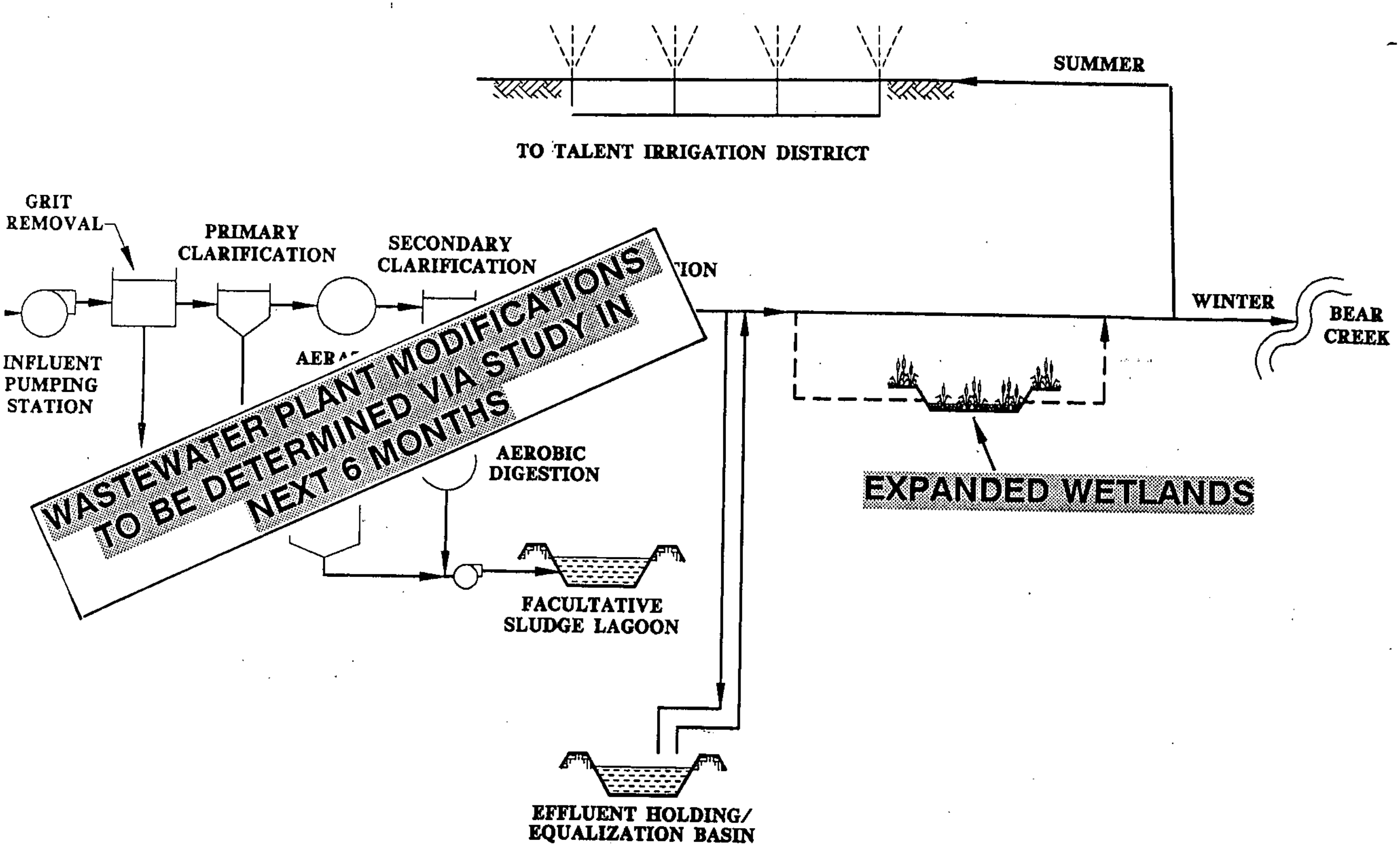


ALTERNATE 3A

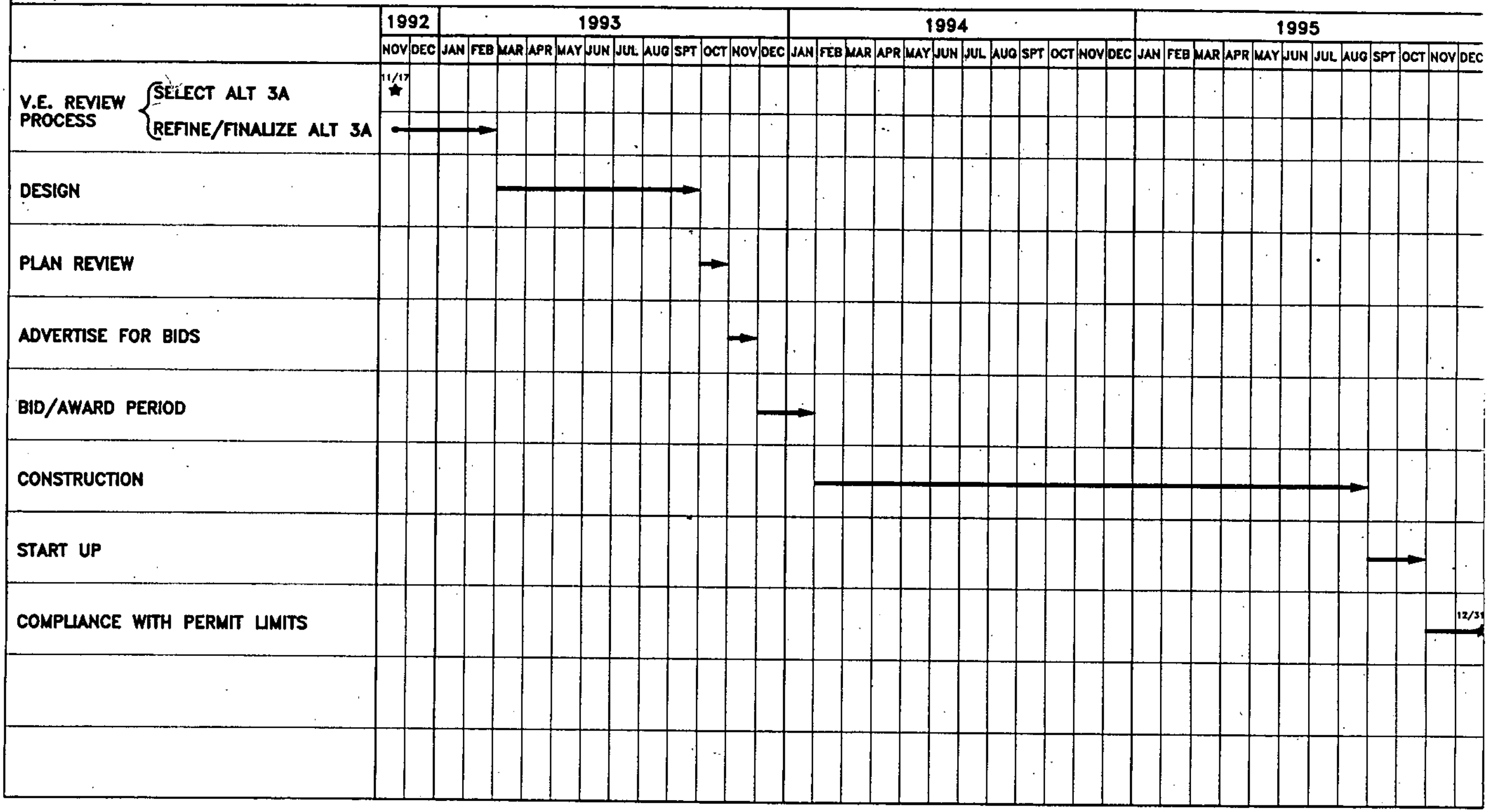
MAJOR WASTEWATER PLANT MODIFICATIONS



MODIFIED ALTERNATE 3A



ASHLAND WASTEWATER TREATMENT PROGRAM
COMPLIANCE SCHEDULE



PUBLIC WORKS DEPARTMENT
WASTEWATER RECLAMATION DIVISION
WATER QUALITY CONTROL PLANT
1100 Kirtland Road
Central Point, OR 97502

CITY OF MEDFORD
MEDFORD, OREGON 97501

TELEPHONE
(503) 826-7943

November 10, 1992

City of Ashland
c/o Steven M. Hall, P.E.
Public Works Director
City Hall
Ashland, OR 97520

Dear Mr. Hall:

Your letter of August 11, 1992, to the Regional Committee has been received. The following responses to the City of Ashland's proposed conditions are only recommendations of the Regional Committee and are subject to unanimous approval of the councils and boards of all Regional Participants:

1. Ashland would be allowed to join the Regional Committee as a Participant in accordance with the conditions established in the September 1985 Regional Sewer Agreement.

2. Ashland's system development charge (SDC) for its existing discharge would be calculated by dividing the total wastewater flow by the flow per equivalent residential unit (ERU) and multiplying that by the SDC per equivalent residential unit in effect at the time it joined the Region. As of November 1, 1992, the SDC is $872.00 per ERU, and the equivalent flow per ERU is 350 gallons per day. This assumes that Ashland's wastewater strength would fall within the parameters established for an ERU and that the peak infiltration/inflow (I/I) does not exceed three times the average daily dry weather flow. If the ratio exceeds 3:1, Ashland will be required to provide an I/I report within three (3) years of joining the Regional Committee, and correct the problem within five (5) years after joining the Regional Committee.

3. Subject to examination of the effects on Interceptor capacity of allowing Ashland to join the Region, the Interceptor buy-in charge will be a percentage of the total interceptor costs increased for inflation to the time of hook-up. The percentage will be calculated using the Ashland flow in #2 above divided by total flow at the Regional Treatment Plant. As of November 1, 1992, the estimated buy-in charge for Ashland would be $4,012,000.00 for the BCVSA Interceptor.

Ashland will also be required to pay toward an interceptor capacity study and any needed up-sizing of the interceptor at an actual flow based percentage, assuming that Ashland connects to the system at the south end of the 36" Interceptor.

The new Ashland Interceptor to the existing 36" Interceptor will be designed to BCVSA standards by an engineering firm agreeable to both Ashland and BCVSA, and will be constructed to BCVSA standards.

4. In keeping with the requirements placed upon all other Participants, the Regional Committee would require immediate payment of Ashland's SDC for the existing discharge.

5. Attached for your review is a copy of the current Regional Sewer Agreement, dated September 1985. It would be necessary to modify the Agreement to include Ashland as a sixth Participant.

6. The Regional Committee has no written by-laws or rules.

I believe this responds to all of the proposed conditions. If the City of Ashland has any further questions, please feel free to contact us.

Sincerely,

Mel Winkelman, Chair
Regional Committee

MW/maf

c: Regional Committee Participants

Brian Almquist, City Administrator

Steven Hall, Public Works Director

Ashland Wastewater Plant
Facilities Plan Selection

ACTION REQUESTED

City Council select preferred alternative and direct staff to finalize and submit the Ashland Facilities Plan to the Department of Environmental Quality (DEQ) before January 1, 1993 as required by the DEQ Stipulation and Final Order.

BACKGROUND

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<u>OPTION 1A</u> Abandon Ashland wastewater treatment plant, construct pump station and pipeline to Phoenix area and discharge raw sewage to Medford wastewater treatment plant. Attached is a letter from the Regional Committee responding

CITY OF ASHLAND

WASTEWATER TREATMENT PLANT

*GOALS AND OBJECTIVES**

Adopted by the City Council

October 22, 1992

Revised/reconfirmed November 3, 1992

GOALS

The Ashland City Council requires the Ashland Facilites Plan to:

1. *Satisfy Oregon Department of Environmental Quality (DEQ) standards for effluent from the Ashland Wastewater Treatment Plant (WWTP);*
2. *Replace the volume of WWTP effluent removed from Bear Creek;*
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STATEMENT OF GENERAL INTENTION

The Ashland City Council will give full consideration to the possible use of multiple objective open surface wetlands technology to assist in achieving the WWTP goals.

MINIMUM OBJECTIVE

The Ashland City Council will determine whether the use of expanded open surface wetlands technology in conjunction with the Ashland Facilities Plan Alternative 3A might produce effluent which could be delivered to the Talent Irrigation District (TID) in exchange for Bear Creek water during summer months, thereby:

1. *Maintaining summer water flow levels in Bear Creek, and*
2. *eliminating the need to establish and maintain the effluent irrigation system proposed in Alternative 3A.*

ACTION ITEMS

The City Council will take the following specific actions to facilitate the achievement of the WWTP Goals by:

1. *Undertaking a program of public education which will encourage voluntary activities to reduce the level of phosphates introduced into the the WWTP; and*
2. *Promptly obtain and fund a study to determine the feasibility of using multiple objective open surface wetlands to achieve the WWTP Goals.*

WASTE WATER

Project Name: Waste Water Treatment Plant Upgrade

Priority: Waste Water # 1 **Score:** 42

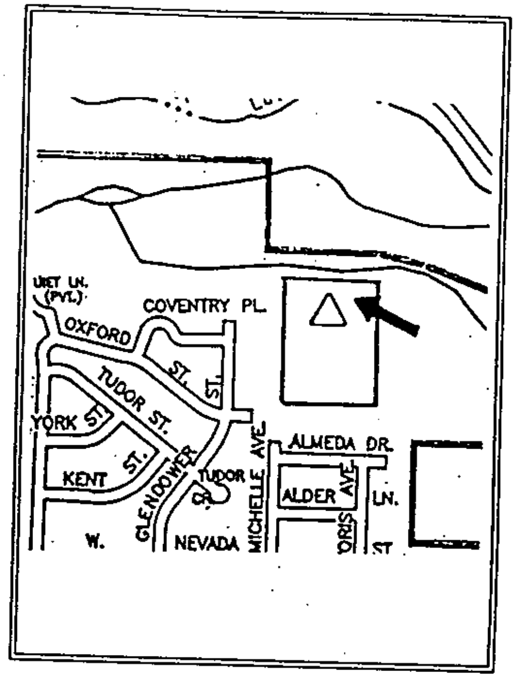
Staff Contact: Steve Hall, Director of Public Works

Useful Life: 20 years

Description: The City will select an alternative by July 1, 1993, for updating its waste water treatment process. The three selected alternatives are partial tertiary treatment and spray irrigation at the existing site, connecting with Medford through BCVSA, or increased waste water treatment with wetlands treatment.

Justification: Required by DEQ/EPA to comply with the Federal Clean Water Act.

Relation to other Projects: None



Fiscal Impact: This project will be built with bond proceeds which will be repaid equally from sewer revenues and property taxes. System development charges will be used starting in 97-98 to repay this debt. The additional operational cost of $697,000 for partial tertiary treatment will be included in additional sewer charges.

	93-94	94-95	95-96	96-97	97-98	FIVE YEAR TOTAL	BEYOND 1998
COSTS							
Land/ROW						0	
Eng/Design	3,700,000					3,700,000	
Construction		12,000,000	4,300,000			16,300,000	
Equipment						0	
Total Costs	3,700,000	12,000,000	4,300,000	0	0	20,000,000	0
FUNDING							
G O Bonds	20,000,000					20,000,000	
Total Funding	20,000,000	0	0	0	0	20,000,000	0
DEBT PAYMENTS							
SDC Treatment					66,000	66,000	2,550,000
Sewer Charges		875,000	875,000	875,000	842,000	3,467,000	12,725,000
Property Tax	0	875,000	875,000	875,000	842,000	3,467,000	12,725,000
Total Debt	0	1,750,000	1,750,000	1,750,000	1,750,000	7,000,000	28,000,000

88-19675

E A S E M E N T

11:19 5.00

KNOW ALL MEN BY THESE PRESENTS:

That Albert B. Wolber

does hereby grant an Easement unto the CITY OF ASHLAND, a Municipal corporation of the State of Oregon, for and in consideration of One dollar ($1.00) which Easement is for installation and maintenance of a storm drain line including but not limited to one manhole

and which Easement is over the property situated in Jackson County, Oregon, described as follows, to-wit:

A strip or parcel of land 15.00 feet in width lying 7.50 feet on each side of the following described centerline.

Commencing at the Southwest corner of Donation Land Claim Number 41, Township 39 South, Range 1 East of the Willamette Meridian, monumented by a 1" iron pipe with a brass cap; thence North 9.31 feet and East 269.92 feet to a point on the Northerly right of Hersey Street for the True Point of Beginning; thence leaving said right of way North 07°02'44" East, 12.57 feet to the center of a storm drain manhole; thence North 21°43'15" East, 108.46 feet to the Easterly boundary line of parcel "B" as shown on that minor land partition filed for record on the 21st day of October 1981 in Volume 4, page 72 of "Minor Land Partitions" of Jackson County, Oregon for the terminus of this easement, the side lines of said easement shall be shortened and/or extended to close upon the boundaries of said parcel.

It is the intent of this easement to replace the Natural Drainage Way Easement as shown on parcel "B" of said minor land partition, and to be centered over the storm drain line improvements.

The Grantor warrants that he is the owner of said real property free and clear of all liens and encumbrances whatsoever, except those of record on the below date.

IN WITNESS WHEREOF, the Grantor has hereunto set his hand and seal this 12th day of September, 19 88.

Albert B. Wolber (SEAL)

STATE OF OREGON)
County of Jackson) : ss.

On this 12th day of September, 19 88, before me, the undersigned, a Notary Public in and for said County and State, personally appeared the within named Albert B. Wolber, who is known to me to be the identical individual described in and who executed the within instrument, and acknowledged to me that he executed the same freely and voluntarily.

IN TESTIMONY WHEREOF, I have hereunto set my hand and seal the day and year last above written.

Easement

Jackson County, Oregon
Recorded
OFFICIAL RECORDS
11:19 SEP 20 1988 A.M.
KATHLEEN S. BECKETT
CLERK and RECORDER
By [signature], Deputy

[signature]
Notary Public for Oregon

My commission expires: 3/23/89

Return to:
City Recorder
20 E. Main
Ashland, Or. 97520

Memorandum

July 1, 1993

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: Ashland Facilities Plan Hearing - Wastewater Treatment Plant (WWTP)

ACTION REQUESTED

City Council receive a brief review of the two options selected from the Brown and Caldwell facilites plan.

City Council receive a more detailed report from Woodward-Clyde on the attached Wastewater Facilities Plan Addendum.

City Council conduct public hearing and select preferred alternative for submission to the Oregon Department of Environmental Quality.

City Council select preferred alternative and direct staff to complete facilities plan and submit to the Oregon Department of Environmental Quality.

BACKGROUND

The Brown and Caldwell Facilities Plan Alternatives 1A and 3A were considered by the City Council at a meeting on August 4, 1992.

> Alternate 1A would dismantle the existing WWTP and construct a pump station and a 30-inch diameter line to the Bear Creek Valley Sanitary Authority 36-inch diameter line near Phoenix.
>
> Alternate 3A would be a major upgrade to the existing WWTP, purchase of land for spray irrigation to grass crops and construction of the irrigation facilities.

At the August 4, 1992 Council meeting, a request was made by the Ashland Wetlands Coalition that the Council reconsider wetlands. After a meeting with Dr. Robert Gearhart, the Council agreed to pursue the request.

Woodward-Clyde was hired to conduct the wetlands option study for the facility plan.

The Oregon Department of Environmental Quality (DEQ) has granted Ashland two extensions to the due date for the facilities plan. Currently, the document is due July 31, 1993 to DEQ.

OTHER AGENCY CONTACTS

The Rogue Valley Council of Governments through Marc Prevost and the In Stream Committee, chaired by Bob Hunter, has met several times to build a concensus with all agencies at the local and state level. Rob Winthrop and I have been heavily involved. I feel that concensus on issues with local agencies such as the Talent Irrigation District and Oregon Water Resources are progressing well.

Rob Winthrop, John Davis (Woodward-Clyde), John Holroyd and Terry Gould (Brown and Caldwell) and I met with Anne Squier to discuss the phased option and see if the Governor's office would consider supporting the option. Neil Mullane from DEQ and Stephanie Burchfield from the Oregon Department of Fish and Wildlife were also present. Anne Squier said she would make arrangements for a meeting with Fred Hansen, Director of DEQ, herself and the City of Ashland.

Three general public information meetings were held during the development process of the facility plan including the joint meeting with DEQ, ODFW, OWR and the Council.

I have received information from Dick Nichols of DEQ that Fred Hanson will be meeting with Anne Squier to discuss Ashland's proposal and situation. I called Dick today and he has not received information back from Fred Hansen as yet. He has left a message in Salem noting that Ashland is holding a public hearing next Tuesday. I hope to have a verbal report on that meeting at the hearing.

The Regional Committee had notified me that they would not extend the offer to Ashland to connect to the regional system after June 30, 1993. I have been in contact with Willie Wassum, current chairperson of the committee, and have received a letter committing to an extension of the offer until their August meeting.

I have also received correspondence from the U.S. Bureau of Reclamation in reference to the questions I posed to them in relation to water trades and water rights. A copy of the letter is attached for your reference.

RECOMMENDED OPTION

Staff recommends that the City Council adopt the staged option B-1 as recommended in the Woodward-Clyde report and direct staff to complete the facility plan and forward the plan to DEQ.

SMH:rm\Sewer\Wtlnds\WWTPHrg.mem

cc: John Davis, Woodward-Clyde Consultants
John Holroyd, Brown and Caldwell Consulting Engineers
Gary Schrodt, Ashland Wetlands Coalition
Marc Prevost, RVCOG
Jim Hill, City of Medford
Chuck Root, BCVSA

encl: Facilities Plan
Letter, USBR
Letter, Hall to USBR
Letter, Regional Committee

United States Department of the Interior

TAKE PRIDE IN AMERICA

BUREAU OF RECLAMATION
Pacific Northwest Region
1150 North Curtis Road
Boise, Idaho 83706-1234

IN REPLY REFER TO:
PN-150/442

RECEIVED
JUN 28 1993

JUN 25 1993

Mr. Steven M. Hall
Public Works Director
City of Ashland
Ashland OR 97520

Subject: Reuse of Treated Wastewater (Your letter dated April 7, 1993) (Water Service Contract)

Dear Mr. Hall:

Thank you for your letter requesting information in regard to the planned upgrade of the City of Ashland (Ashland) wastewater treatment plant. As you are aware, there have been previous discussions between Ashland and the Bureau of Reclamation (Reclamation) concerning this topic, and we wish to be of assistance in this matter. We have reviewed your letter and offer the following comments for Ashland's use in its decisionmaking process.

Background: The Talent Division of the Rogue River Basin Project (Project) was constructed in 1957-61 under authorization of the Act of August 20, 1954 (Public Law 83-606). Recognition of Talent Irrigation District's (District) existing contractual arrangement to deliver 800 acre-feet annually to Ashland was included in the design, construction, and repayment of the Project works. The State of Oregon's (State) position has been that the State's withdrawal of water for the Talent Division at that time was for the purposes of irrigation and domestic farmstead use only and thus, did not permit municipal and industrial (M&I) uses. Subsequently, in 1979, the State issued a permit for the United States to store 2,195 acre-feet of water in Howard Prairie Reservoir for municipal use within described service areas for the cities of Ashland and Talent. This permit enabled implementation of a 1978 water service contract, among the United States, City of Talent (Talent) and the District, which provides up to 600 acre-feet annually to Talent for M&I use from the Project's Howard Prairie Reservoir. Accordingly, it is our interpretation that the existing State permit would not require any modifications in order to allow an additional 795 acre-feet of Howard Prairie Reservoir storage to be made available to Ashland and Talent for municipal use. Please be aware the State does not consider a permit to be a "perfected" water right; that status would not be achieved until such time a water right certificate is issued by the State.

Water exchange: We have no objection to the concept of a 1:1 water supply exchange between Ashland and the District for the purposes outlined in your letter; however, we would want to review and approve the details of such an exchange prior to final arrangements between the two parties.

Request for additional water supply: The process becomes more complicated should Ashland desire to obtain an additional Project water supply. In the interest of time and simplicity, Ashland also might want to pursue the possibility of obtaining additional Project water through a fixed-term, three-party, water service contract with the United States and the District, similar in concept to the above-mentioned contract with Talent. Such a contract would, of course, be dependent upon Ashland-District arrangements for physical delivery of the water and approval by the State. The maximum term of contract permitted under our current contracting policy is 25 years. We have not established the Federal water service charge for such use, but would advise it very likely would be at least three or four times the $10.00 per acre-foot determination used in the 1978 contract with Talent.

We do not rule out the future possibility of Ashland somehow acquiring storage water rights through the purchase of agricultural lands, but caution this would involve the resolution of many new issues and the cooperation of many parties.

National Environmental Policy Act requirements: You requested information on Reclamation's requirements under the National Environmental Policy Act (NEPA). Prior to taking Federal action, Reclamation must comply with provisions of NEPA as well as other environmental and biological compliance laws and regulations such as the Endangered Species Act, Fish and Wildlife Coordination Act, Archeological and Historic Preservation Act, Clean Water Act, as well as Protection of Wetlands and Floodplain Management Executive Orders. Federal actions may include approval of the wastewater reuse proposal or could involve issuance of crossing agreements or permits where other alternative actions affect Reclamation facilities. Regardless of the type of action proposed, respective NEPA and other environmental and biological compliance actions would be required.

It is Reclamation's responsibility to determine what environmental and biological compliance actions are required and the level of NEPA documentation. Reclamation has determined that Ashland's wastewater reuse proposal may have tangible or controversial environmental effects. In this case, public perception of using treated wastewater would be a key issue as would maintenance of instream flows and water quality. Therefore, Ashland would be required to submit an Environmental Report (ER) which fully analyzes the environmental impacts of the proposed action and viable alternatives. The ER would form the basis of Reclamation's NEPA document, which in this case would be at least an environmental assessment (EA). If, after public review, no significant environmental effects were identified, Reclamation would finalize the EA and prepare a Finding of No Significant Impact (FONSI) and take the necessary steps to approve the action. This total process may take a few months or up to a year to complete depending on the complexity of the proposed action and the issues raised. We do not wish to speculate at this time as to any possible challenges by other agencies to a FONSI or the potential impacts of any such challenges.

If through the EA review process, significant or highly controversial environmental effects were identified, Reclamation would be required to proceed with preparation of a draft Environmental Impact Statement (EIS) based on an updated and more detailed ER from Ashland. The draft EIS would be sent out for public review and comment and a public hearing(s) would be held. A final EIS would then be prepared based on the comments received. The final EIS would also be sent out for public review, after which Reclamation would prepare a Record of Decision. If the decision were favorable, Reclamation would take the necessary steps to approve the action. This total process may take up to 2 years or longer depending on the complexity of the proposed action and the issues raised.

<u>Operation and maintenance (O&M) of certain canal portions</u>: We would prefer not to change the present arrangement whereby the District is responsible for O&M of the Project distribution system, both inside and outside the city limits of Ashland.

<u>Easements</u>: If Ashland pursues the water service contract approach, we assume your question concerning prepayment of certain canal portions would be moot. In any event, easements would not be transferred from the United States to either the District or Ashland.

We hope the above discussion is helpful to Ashland in developing its wastewater treatment program. Further questions undoubtedly will arise; feel free to contact Robert "Hap" Boyer of this office at (208) 378-5334.

Sincerely,

Acting Dave D. Raletto

Regional Director

cc: Mr. Hollie Cannon
Secretary-Manager
Talent Irrigation District
PO Box 467
Talent OR 97540-0467

Mr. Al Cook
Southwest Regional Manager
Oregon Water Resources Department
101 NW. A St.
Grants Pass OR 90526

CITY OF ASHLAND CITY HALL
ASHLAND, OREGON 97520
telephone (code 503) 482-3211

April 7, 1993

Mr. John Keys
Regional Director
U.S. Department of the Interior
Bureau of Reclamation
Box 043-550 West Fort Street
Boise, Idaho 83724-0043

Dear Mr. Keys:

A meeting was held at the Rogue Valley Council of Governments (RVCOG) office to discuss Ashland's options for the upgrade of our wastewater treatment plant to meet new standards set by the Oregon Department of Environmental Quality (DEQ). The new standards are driven by the Clean Water Act of 1972. The receiving stream, Bear Creek, has been classified as "water quality limited" by DEQ under the terms of the Clean Water Act.

Dave Duncan from your Boise Office and Brian Person from your Bend, Oregon office were in attendance.

The intent of the meeting was to explore the possibility and potential fatal flaws of several issues which involve the Bureau of Reclamation, the Oregon Water Resources Department, the Talent Irrigation District and the City of Ashland.

The City of Ashland is considering several options to meet the new DEQ standards for Bear Creek. In General, the City of Ashland cannot meet the strict water quality standards for summer or low flow season which is approximately May 1 through November 30.

One of the options under consideration is to construct some improvements to the existing Ashland wastewater treatment plant and constructing a wetland as the final phase of treatment. As envisioned by our consultants, the constructed wetland would have the capacity to store water for certain periods of the year.

A critical part of the constructed wetland option is the trade of water between the City of Ashland and the Talent Irrigation District during their normal irrigation season. TID has indicated a willingness to work with Ashland on the trade of water. The trade would involve Ashland placing a high-quality treated wastewater into the TID canal during the critical low flow months for Bear Creek. TID would then release an equal amount from Emmigrant Lake to offset the removal of Ashland's treated wastewater.

The projected storage capacity of the constructed wetland would provide for a safety factor to virtually eliminate the possibility of spills from the wastewater system into the TID canal system.

Ashland is also considering the use of ultraviolet light for disinfection of the wastewater. If chlorinization is selected for disinfection, DEQ will require dechlorinization of the effluent before the wastewater reaches the constructed wetlands.

Based on these factors, a key question is whether the USBR will lessen the requirements of providing an Environmental Assessment Summary or Environmental Impact Statement to a Finding of No Significant Impact based on these factors? If the answer is yes, I would like to have USBR's perception of possible challenge by other agencies to a FONSI and the potential impacts of such a challenge.

In order to offset the flows in Bear Creek during the period after the TID irrigation season and the end of the DEQ mandated summer low flow season, Ashland would have to acquire stored water rights to offset the wastewater loss. The period of time is approximately September 30 through November 30.

This poses another potential problem of the transfer Ashland acquiring stored water rights and then changing the point of application and the conversion of the rights from agricultural to instream use. The question raised is will the City of Ashland be required to pay a differential rate to offset the subsidies as would be required in a change from agricultural to municipal and industrial use?

We also discussed the possibility of the City of Ashland paying off the debt on stored water rights that Ashland might acquire from other land. The question is two-fold on this issue:

1. Would the City of Ashland be required to pay only the principle on the remaining debt or would other costs be incurred? If additional costs would be incurred, would you please give an indication of the type and amount.

2. If the City of Ashland paid the debt in full, would the issue of subsidy of water be moot?

The Talent Irrigation District has indicated that they would prefer Ashland to assume the operation, maintanence and liabilities of all canals within Ashland's city limits. The indication is that USBR would not allow the direct transfer of responsibility, but might allow a contractural agreement between TID and the City of Ashland. Would you please respond to this issue, including USBR requirements including maintenance standards, liability issues. etc.

I would also like to have an indication of the effect of Ashland paying the bonded debt in full on that portion of the canal on such a proposal. The portion of canal under USBR jurisdiction is located between Tolman Creek Road to the existing City of Ashland Canal. Would the easement held by USBR then be transferred to TID or the City of Ashland?

As I noted in the RVCOG meeting, these issues do not have to be finalized, but a reasonable comfort level has to be presented to the Ashland City Council to allow them to make a decision prior to July 1 of this year. That is the date the City of Ashland has to present DEQ with Ashland's preferred alternative.

In addition, Hap Boyer and Monte McClendon of your Boise office have a good understanding of Ashland's proposal and have been extremely helpful and supportive of the project.

I believe a win-win situation is within our collective grasp, although the tight time frames make it a bit more dicey.

Thank you for your consideration of these requests. If you or your staff have any questions, please contact either Marc Prevost at the RVCOG [(503) 664-6674] or myself [(503) 482-3211].

Sincerely yours,

Steven M. Hall, P.E.
Public Works Director

SMH:rm\Sewer\USBR.ltr

cc: Brian Almquist, City Administrator
Rob Winthrop, City Council Liaison
Dave Duncan, Oregon Planning Liaison, USBR
Brian Person, P.E., Oregon Projects Coordinator, USBR
Hap Boyer, Irrigation Systems Specialist, USBR
Doug James, Environmental Compliance Officer, USBR
Marc Prevost, Water Quality Coordinator, RVCOG
Bob Hunter, Chairperson, RVCOG Instream Committee
Al Cook, Regional Manager, SW Region, OWRD
Gary Schrodt, Ashland Wetlands Coalition
Hollie Cannon, TID

BEAR CREEK VALLEY SANITARY AUTHORITY

PHONE (503) 779-4144 • 3915 SOUTH PACIFIC HWY. • MEDFORD, OREGON 97501

RECEIVED
JUN 29 1993

June 28, 1993

Steve Hall, PE
Public Works Director
City of Ashland
20 E. Main
Ashland, OR 97520

Dear Steve:

We will be able to extend our offer to you to join the regional system until at least August 2, 1993. That is the date of our next Regional meeting. Four of the five members have agreed to this extension. The fifth has just not had a chance to discuss the issue. Since we knew you needed an answer by June 30, we decided not to wait to possibly make this unanimous.

You and other representatives from Ashland are invited to attend the August 2 meeting. This would allow you to explain further the reasons for any additional extension.

A related item on the agenda will be consideration of a policy on how any future requests to join the region will be handled. Your discussion may help us with that issue as well.

Sincerely,

Walter W. Wassum cab

Walter W. Wassum
Chairman, Regional Committee

WWW/cab

L179-3

cc: Maridee Fancher
Members of the Regional Committee
Jim Hill
Dave Kucera

Tlow

Memorandum

July 14, 1993

To: City Administrator, Mayor and City Council

From: Steven Hall, Public Works Director

Subject: "The Ongoing Saga"

UPDATED/DETAILED COSTS
See attached 4 pages.

RESPONSE FROM GEARHART TO HALL'S MEMORANDUM
See attached 4 pages.

NOTE: If needed, Dr. Gearhart will be available by telephone during the meeting.
TEL: (707) 826-3135, FAX (707) 826-3135.

PARKS MEMORANDUM
See attached page.

DISCUSSION W/STATE
This morning Rob, Brian and I were contacted by Fred Hansen and Anne Squier. Also on the line was Neil Mullane of DEQ.

The Governor's office, Department of Environmental Quality, Department of Fish and Wildlife, Water Resources Department and the Department of Agriculture have met and have a suggested course of action which all agencies endorse and commit to working with Ashland for a solution.

The proposal is to form a basin approach to solving the water quality issues. The basin approach would initiate through discussions with the state agencies and City of Ashland. The goal would be to devise a long term plan and strategy to meet the overall needs of Bear Creek. The major issues in the basin approach include point sources (WWTP, log pond and storm drain discharges), nonpoint sources (natural runoff, overland flow, ground water contamination) and adequate stream flow.

Hansen indicated it would take 2 to 5 years to put the plan, agreements and facilities in place. He also noted he had spoken with the Environmental Quality Commission and feels that they also agree to work towards such a solution.

Hansen also said that all agencies agreed that the removal of Ashland's WWTP flow would harm the fisheries' habitat.

Squier noted that this is "as good an opportunity as we will ever get."

The crux of the suggestion is that the ultimate commitment is to connect to Medford.

Rob asked what DEQ's views were on the phased approach proposal. Hansen said that DEQ believes that the phased approach would violate instream standards and that they could not support the proposal. DEQ has determined that the phased approach would not work within the standards set by EQC/DEQ. Hansen also noted that they do not consider any of their science "soft".

Brian asked if option 3-A (spray irrigation) was acceptable. Mullane answered no. DEQ does not believe that the solution is adequate to meet the needs for the next 1, 2 or 3 decades.

Squier suggested that the Council not make a decision on a specific option, but agree to explore the proposal with the state agencies and governor's office.

Hall asked if the dates in the SFO are of concern. Hansen said no. Hall asked Hansen if this information was cleared for public use. Hansen said yes, the governor's office, DEQ, ODFW and DA have concurred and support the proposal.

The conversation terminated and Hall told Mullane he would contact him Thursday morning with the Council's response.

Hall also noted that he didn't believe the Council would reach consensus and a decision tonight.

SMH:rm\Sewer\Wtlnds\Saga.mem

encl: Cost Update (4 pps)
Gearhart Response (4 pps)
Parks Memo

Present Worth Comparison

Item	Alternative					
	1 Pipeline to Medford	3A-1 Discharge winter, irrigate summer	B-1 Discharge via wetland	A-2 Wetland, TID summer	A-1 Wetland, irrigate summer	B-3 115 to 125-acre wetland
Capital cost, $1,000	15,936	17,961	15,715	19,324	21,604	22,505
O&M cost, $1,000 per year	564	904	779	866	991	821
Salvage value, $1,000	(1,300)	(2,328)	(1,674)	(1,971)	(2,985)	(2,867)
Present worth, $1,000	22,301	27,918	24,628	29,122	32,087	30,795

FAX Memo

\# Pages 4

Date: 7-14-93 Time:

To: Steve Hall

Location: Ashland

FAX #:

From: Terry Gould

Location: Brown & Caldwell

FAX#: 488-5311 Phone #:

Table __. O&M Costs

Item	Alternative cost, $1000				
	3A-1	Wetland B-1	Wetland A-2	Wetland A-1	Wetland B-3
Current WWTP O&M costs	505	505	505	505	505
Additional power and materials costs					
Grit removal	-	-	-	-	-
Comminutors	-	-	-	-	-
Primary clarifier	-	-	-	-	-
Aeration basins and blowers	55	55	55	55	55
Secondary clarifiers	3	3	3	3	3
Disinfection	12	37	12	37	37
Chemical feed/flocculation	8	8	8	8	8
Tertiary filter	15	15	15	15	15
Irrigation pumping stations	17	-	-	17	-
Effluent storage/irrigation system	41	-	31	41	-
Anaerobic digesters and control bldgs	4	4	4	4	4
Sludge thickener (DAFT)	32	32	32	32	32
FSL	9	9	9	9	9
Sludge transport	11	11	11	11	11
Wetlands	-	23	23	23	46
Subtotal	712	702	708	760	725
Labor	192	77	158	231	96
Total	904	779	866	991	821

Table __ Capital Costs

Item	Alternative cost, $1000					
	1	3A-1	Wetland B-1	Wetland A-2	Wetland A-1	Wetland B-3
Grit removal		12	12	12	12	12
Comminutors		0	0	0	0	0
Primary clarifier		58	58	58	58	58
Aeration basins, existing		210	210	210	210	210
Aeration basins, new		784	784	784	784	784
Blowers (including building)		450	450	450	450	450
Secondary clarifier No. 1		160	160	160	160	160
Secondary clarifier No. 2		10	10	10	10	10
Secondary clarifier No. 3		464	464	464	464	464
Chlorine contact		0	0	0	0	0
Disinfection		210	450	210	450	450
Chlorine scrubbing		150	-	150	-	-
Chemical feed/flocculation		298	-	298	-	-
Tertiary filter		425	285	425	285	285
Irrigation pumping stations		236	-	-	236	-
Effluent storage/irrigation system		2,146	-	1,375	2,146	-
Anaerobic digester No. 1 mods		148	148	148	148	148
Anaerobic digester No. 2		337	337	337	337	337
Digester control building		690	690	690	690	690
Demolish secondary digester		120	120	120	120	120
Sludge thickener (DAFT)		225	225	225	225	225
FSL		550	550	550	550	550
Sludge transport		262	262	262	262	262
Subtotal		7,945	5,215	6,938	7,597	5,215
Electrical/instrumentation		1,339	879	1,169	1,280	879
Yard piping		1,316	864	1,150	1,259	864
Contractor indirect costs		957	628	835	915	628
Subtotal	13,936	11,557	7,586	10,092	11,051	7,586
Salvage	(2,848)	(3,005)	(1,972)	(2,624)	(2,873)	(1,972)
Wetlands	0	291	3,230	3,230	3,230	7,730
Wetlands salvage	0	(125)	(1,389)	(1,389)	(1,389)	(3,324)
Subtotal		11,848	10,816	13,322	14,281	15,316
Contingency at 20%		2,370	2,163	2,664	2,856	3,063
Subtotal		14,218	12,979	15,986	17,137	18,379
Engineering/administration at 20%		2,844	2,596	3,197	3,427	3,676
Subtotal		17,061	15,575	19,184	20,564	22,055
Land		900	140	140	1,040	450
Total capital cost	15,936	17,961	15,715	19,324	21,604	22,505

Discount rate	0.04
Study period, years	20

Item	Alternative cost, $1000					
	1	3A-1	Wetland B-1	Wetland A-2	Wetland A-1	Wetland B-3
Capital costs	15,936	17,961	15,715	19,324	21,604	22,505
O&M costs	564	904	779	866	991	821
PW O&M costs	7,665	12,286	10,587	11,769	13,468	11,158
Salvage	(2,848)	(3,130)	(3,361)	(4,013)	(4,262)	(5,296)
PW salvage	(1,300)	(1,428)	(1,534)	(1,831)	(1,945)	(2,417)
PW land salvage	0	(900)	(140)	(140)	(1,040)	(450)
Total PW	22,301	27,918	24,628	29,122	32,087	30,795

Table 9-1. Estimated Capital and Annual Costs for Alternative 1

Item	Cost, $1,000
Demolish existing plant	200
Conveyance to Medford	4,746
Medford WWTP SDC	4,484
BCVSA SDC	4,012
Subtotal	13,442
Contractor indirects	495
Subtotal	13,936
Contingency (a)	1,000
Subtotal	14,936
Engineering, administration (b)	1,000
TOTAL CAPITAL COST	15,936
Annual costs	
Oper and maintenance	9
Materials	2
Medford WWTP service charge	245
SDCs for future users	170
BCVSA service charge	18
Administration	120
TOTAL ANNUAL COST	564

Notes:
(a) Contingency: 20% (0% on SDCs)
(b) Engr/admin: 20% (0% on SDCs)

Steve Hall
Public Works Director
Ashland, Oregon

Steve

I have just received a copy of the memo to Brian Almquist on the 90 acre wetland alternative. I am responding to your comments in this fax and sending copies to John Davis and John Holroyd. The information you have received from us represents the work we had performed 6 weeks ago in hopes of inclusion in the draft document. I do appreciate you taking the time to read and comment on this document. It is truly unfortunate that you did not have time to review the information 6 weeks earlier and that we did not have an opportunity to discuss some of the various strategies prior to the final (draft) document presented to the city council. I am including in this fax a copy of the letter you sent me in October and the scope of work we agreed on. We argued then as we argue no there is a different way to approach these technical issues and institutional constraints. I thought early on that you and Brian were interested in that point of view. It is important to realize no matter what happens with the effluent from any of the alternatives, all of the suggestions concerning source control and water conservation still apply. Even if you go with the Medford Mainline alternative you must negotiate a service cost based upon organic, hydraulic, and nutrient loading. John Davis did tell tell me this morning that Medford has a new number for tying into their system. That doesn't surprise any of us. If this is a a poker game, though, I feel alot of well intention people have been used in the process.

What we argued for was a Bear Creek Master Plan alternative which could serve both as vision statement and a technical alternative for meeting DEQ's requirement. The objective of which is to return the stream to a healthy and sustainable level. Dealing with this problem as if it were only a WWTP discharge issue is not in the best interest of receiving waters and the ecological value of the system. Only the City can frame the problem in those terms, as you are aware. Since the regulatory agencies cannot agree on the management plan, it is incumbent on the City to exert leadership and direction.

Responses to you comments:

1. (referred to in memo to B. Almquist as "page 5")- A minor upgrade, with increased aeration and flow reduction, would increase the mean cell residence time in the existing aeration tank allowing for partial nitrification. The BOD loading to the existing activated sludge system is 25 lbs/1000 cubic feet of aeration. Placing the two tanks in series and equalizing wet weather flows by using the first marsh as a backup treatment system will produce a 70% nitrification on the average. Using a 60 mg/l influent TKN value this would produce a 4-5 mg/l ammonia level in the effluent.

2. page 5- Continued phosphorus source control could reduce the influent P to 4.5 mg/l (down from the existing 6.5) and the treatment plant would remove approximately 2 mg/l (John Holroyd)

3. page 7-Simply a subtraction problem-if your reduce the influent by 2 mg/l and the activated sludge removes 2 mg/l from the effluent than you have 2 mg/l remaining. If you are questioning source control effectiveness than I would ask why are you baning phosphorus in clothes detergents. You have already achieved the most important step in a public information program. You might be surprised in how effective further source control will be. It is something everyone can do to assist you in discharging your public works function besides paying their bills.

4. (page 10)- Any other word would be acceptable. All flow and concentrations of pollutants are estimated basis upon given assumptions, including demographic and economic projections.

5.(page 21) covered later

6. covered earlier

7.- good point we did not add to the report, perhaps a summary table the implementation times for all the projects.

8. (page 2) We were asked by you to work with the Ashland Wetlands Coalition as a source of citizens input. I am presently involved in several other similar projects and would rate your citizens involvement high in terms of input, education, and commitment. Many communities would be envious at this resource of concerned and active citizens.

9. (page 5) NPS wetland discussion is critical in overview-These systems are less costly to build, and other funds are available for these type of projects. Contact the Region 10 reference I passed on to you if you are interested. Our estimate of the cost of the NPS marsh sized to produce the water quality in Bear Creek shown in Table 5 follows:

Land, 20 acres total	$100,000
Sitework for 15 wetted acres	$150,000
Planting	$ 20,000
Control Structures	$ 32,000
TOTAL	$302,000

This marsh does not need to be lined for regulatory reasons, but a layer of clay might need to be placed to improve water retention if that is one of the goals.

10 (page 5)- UV disinfection is a more effective in denaturing viruses and in killing pathogenic bacteria. UV effectiveness is a function of the turbidity of the water. A SS of less than 5 mg/l will produce an effluent with less than 2 NTU. The proposed effluent of less than 5 mg/l of BOD and SS will allow its use. It is the disinfectant of choice going into a cold water fisheries stream. chlorine and its by-products are known acute and chronic toxins to aquatic organisms. UV is less costly than chlorination and dechlorination.. Using UV does away with the industrial hazards of chlorine gas in a high density housing area. I would be glad to provide you with EPA's revised effluent disinfection guidelines. I was on the EPA reviewed committee for these guidelines.

11. (page 6)- The 60 acre wetland would remove 1.5 to 2.0 mg/l of phosphorus during the growing season. This represents approximately 0.52 lbs/acre at a flow rate of 1.9 MGD. Steve, I have included a copy of paper I am presenting at the annual WEF conference for back-up on what we have found and what other researchers have found..

12. (page 6)-Returning the conserved flows to the baseflow of the system appeared straight forward, but I guess it is not.. It was just an alternative that in the grand scheme would assist in sustaining critical flows to the system.

13. (page 8)- Consultants have talked with the developers and all have agreed it is a viable opportunity. City Park staff have insured co-operation. Please contact Mr. K. Mikleson.

14. (page 11)-rapid infiltration was only an alternative for further consideration if other options were not available. It would be very easy to construct a pilot system to acquire this data in advance. Plato could help.

15. (page 17)- What is wrong with the City of Ashland setting a goal for minimum stream flows. It is to your advantage to lead the resource agencies in this regard.

If there are other questions you have please call or fax them to us as soon as possible. My experience in Ashland has been both interesting and educational.. I have learned that public participation in wastewater planning must be institutionalized if it is to be effective. My experience to-date has been more on the EPA community participation process which allows for a more effective dialogue between the interested and concerned parties.

Sincerely,

Bob Gearheart

cc: R. Winthrop
J. Davis
J. Holroyd

Excerpt: Ashland RFP for constructed wetlands study 11/9/92

III. The selected consulting engineering firm will perform the following tasks:

1. Analyze the use of constructed wetlands to meet the City of Ashland City Council Goals and Objectives. This will, as a minimum, include:

   A. the ability of combined treatment (WWTP and constructed wetlands) to continually meet summer, winter and Class 4 effluent standards established by EQC and DEQ;
   B. the reliability and consistency of effluent from a constructed wetlands system to meet TMDLs established by EQC and DEQ;
   C. the area of land required for constructed wetlands to meet current needs and incremental expansion for a 20-year design period;
   D. identify specific parcels of land for a constructed wetland;
   E. develop capital and operation and maintenance costs for a constructed wetland;
   F. develop discharge standards required from WWTP to constructed wetlands.

2. Analyze the upper Bear Creek phosphorous budget. Determine the distribution of phosphorous and nitrogen from the natural, urban, agricultural and wastewater components of the Bear Creek watershed. This analysis should also include mass loading and concentration at various flow conditions for the watershed.

3. Analyze the upper Bear Creek soil characteristics (phosphorous absorption) and areas of historical or biological importance to be protected or avoided during any upgrading project.

4. Analyze the upper Bear Creek watershed for temperature and flow variations (including flows from sluicing Reeder Reservoir) for support of anadromous fish population. A study is available that was conducted by the Rogue Valley Council of Governments, Oregon Department of Fish and Wildlife and the U.S. Forest Service in 1991 and 1992. Develop a set of management strategies to use in combination with flow control from a constructed wetland system to enhance the habitat of upper Bear Creek.

5. Analyze Ashland's water conservation program and its probable effect of design capacity of the WWTP and constructed wetland alternative.

6. Analyze the use of ultraviolet disinfection versus chlorination in relation to wetlands and water quality in Bear Creek.

7. Analyze and quantify the effects of ammonia versus nitrate discharge from the WWTP on the efficiency and operation of constructed wetlands

ASHLAND PARKS AND RECREATION COMMISSION

CITY HALL • ASHLAND, OREGON 97520 • 488-5340

July 14, 1993

Mayor Golden and City Councilors
City of Ashland
Ashland, Oregon 97520

Honorable Mayor and Councilors:

If the Ashland City Council chooses the wetlands option for a sewage treatment facility, the Ashland Parks and Recreation Commission would like to be involved in the recreational planning for the area.

Sincerely,

Patricia Adams

Patricia Adams, Chair
Ashland Parks and Recreation Commission

cc: Steve Hall
Gary Schrodt

2:MISC-93\WETLND.93

Tlam

personal rating from Steve Hall

CITY OF ASHLAND
DEPARTMENT OF PUBLIC WORKS
DECISION MATRIX
ASHLAND FACILITY PLAN
JULY 14, 1993

ITEM	OPTION 1-A	OPTION 3-A	OPTION B-1	OPTION B-3
CONSTRUCTION	$15,936,000	$17,961,000	$15,715,000	$22,505,000
CITY MAINTENANCE	$ 11,000	$ 505,000	$ 505,000	$ 505,000
ADDITIONAL MAINTENANCE	$ 553,000	$ 399,000	$ 274,000	$ 316,000
TOTAL MAINTENANCE	$ 564,000	$ 904,000	$ 779,000	$ 821,000
TOTAL 20 YEAR COSTS	$22,301,000	$27,918,000	$24,628,000	$30,795,000
MEET STANDARDS?	YES	YES	ALL BUT PO_4	ALL BUT PO_4 ?
THE FOLLOWING ARE RATED ON A SCALE OF 1-5, 5 BEING THE BEST RATING.				
ENVIRONMENTAL BENEFITS	0	3	5	5
CERTAINTY OF SUCCESS	5	3	0	2
EASE OF IMPLEMENTATION	5	3	2	3
EASE OF OPERATION	5	3	3	2

Ylw

Memorandum

July 13, 1993

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director JMH

Subject: Large Wetlands Option

ACTION REQUESTED

City Council consider the attached report for a 90-acre wetlands prepared by Dr. Gearhart with the other options proposed by Brown and Caldwell and Woodward-Clyde.

Staff still recommends adoption of the phased or staged option B-1, as per the Woodward-Clyde facility plan addendum.

BACKGROUND

At the last meeting, the City Council asked Dr. Gearhart to provide the City Council with a large wetlands option with limited improvements to the Ashland wastewater treatment plant (WWTP) based on the request of the Ashland Wetlands Coalition.

The attached report is the result of that request of Dr. Gearhart.

Dr. Gearhart and John Holroyd will not be in attendance because of prior commitments. John Davis from Woodward-Clyde and Terry Gould from Brown and Caldwell will be available at the meeting.

COMMENTS

While I realize that Dr. Gearhart did not have sufficient time to put the report in a manner he might prefer, I must express some comments and concern about the document.

The cost figures used in Table 3, page 7 are lower than those produced by Woodward-Clyde. In addition, operation and maintenance costs and total capital costs are not included in the report. John Davis is reviewing the costs in Dr. Gearhart's proposal and will place them in the same format and cost basis as the other options so a comparison can be made between the four options.

I have a concern about apparent inconsistencies in the projected phosphorous and ammonia load required from the WWTP. I have **HIGHLIGHTED** words for emphasis.

> Page 5, System Components, first bullet, "the [minor] upgrade would include improvements to produce an ammonia effluent from the plant of 6 mg/l."

> Page 5, Compliance with Standards, second sentence, "Source control for phosphorus **COULD** reduce the phosphorus concentration from the treatment plant to 2.3 mg/l."

Page 7, The Role of Free Surface Constructed Wetlands for Ashland, "2. Given an ammonia level of 2 mg/l from the secondary treatment ..... 4. .... will reduce a secondary treatment system effluent of 2 mg/l phosphorus ...."

Page 10, Implementation Strategy-Phased Implementation, first paragraph, 7th line, "It is **ESTIMATED** that the phosphorus source control [WWTP influent] can reduce influent levels of phosphorus to 3-4 mg/l." and 11th line, "A source control target of 3 to 4 mg/l influent of total phosphorus has been used in this analysis. A more aggressive campaign **COULD POTENTIALLY** reduce this level another fifty percent.", second paragraph, line 3, "We have **ASSUMED** that the existing 2 mg/l removal of phosphorus or 32 lbs/day will apply in the upgraded treatment plant."

Page 21, last paragraph, line 5, "**IF** effluents from a treatment plant were in the range of 1-2 mg/l it is **POSSIBLE** that constructed free surface wetlands **COULD** be used to remove phosphorus in the growing season that would meet the phosphorus limiting concentrations in receiving streams or estuaries."

John Holroyd and Terry Gould (Brown and Caldwell) are out of town so I spoke to Steve Celeste. I asked Steve if the minor upgrade could produce a consistent 2 mg/l ammonia and phosphorus effluent quality. He indicated that without nitrification (major upgrade), the WWTP would not consistently produce ammonia at the 2 mg/l. Similarly, he indicated the ability of the plant to produce a 2 mg/l phosphorous consistently during the summer months would be difficult.

I am trying to make contact with John Davis to see if he concurs with Steve Celest's comments.

Dr. Gearhart indicated it takes 2 years for a constructed wetland to meet projected removals. This is not indicated in his report.

Although rather nit-picking, on page 2, Ashland's Goals and Concerns, 6th paragraph, first line, I don't believe that the Ashland Wetlands Coalition are "representing the citizens of Ashland."

Page 5, third paragraph, 7th line, "approximately 30-40 acres for treating NPS [non-point sources] of contamination in the Bear Creek watershed." There is very little discussion or specificity to the recommendation such as where, how and how much. NOTE: Just received a fax from George Waller on this issue and it is included in your packet.

Page 5, System Components, first bullet, line 3, "The existing effluent chlorination system would be abandoned and replaced with an ultra-violet light disinfection system." Both Brown and Caldwell and Woodward-Clyde have expressed concerns about the UV systems' ability to consistently meet class IV effluent standards. Of particular concern is the bacteriological requirements of 2.2 total coloform organisms per 100 ml. The TID or golf course irrigation options require a class IV effluent.

Page 6, Table 1, Wetland Alternative B-3, the term "background" for total phosphorus needs to be numerically defined. The numerical "definition" is listed on page 7, paragraph 5, "In a 60-acre wetland, phosphorus levels would be between 0.05 and 0.10 mg/l during the growing season." These removals are based on a rapid infiltration site which I don't believe the costs are factored in to the cost table. Dr. Gearhart has indicated that the growing season is generally June, July and August.

Dr. Gearhart is proposing that water saved through water conservation be used to supplement low flows in Bear Creek. See Page 6, 1st paragraph, 7th line, "Water saved in Ashland's water conservation program **WOULD REMAIN** as low flow augmentation to Bear Creek during these times also." and page 9, lower left hand box, 4th item, "Conservation/Reeder reservoir management, release through Ashland Creek." The intent of that "new source" of water is for potable use in the City of Ashland. If that is used in Ashland Creek for make up water in Bear Creek, Ashland would have to pump more TID water to the plant for treatment and increase the amount of treatment. This is not an acceptable recommendation.

On page 8, first and second full paragraphs, Dr. Gearhart refers to using the "Billings Marsh site and Wright's Creek site" for part of the wetlands treatment system. During the early discussions of potential sites, it was noted that all, or at least major portions, of these two sites were required for the proposed golf course.

Page 11, second paragraph, 6th line, "This system would have sufficient capacity to remove phosphorus at this level for 5-7 years if only summer wastewater flows were processed." This proposal is for year-round processing. Also, what has to happen after 5-7 years' use? Does the wetland have to be harvested, reconstructed or ??? If year-round treatment is required, what will the lifespan of the wetlands be? What are the associated costs of operating and maintaining the facility?

Page 17, last paragraph, first line, "An **ASSUMPTION** of flow in Bear Creek of no less than 10 cfs also seems justified. ..... It seems very probable that this flow can be accomplished by use of purchased and already controlled water rights." Ashland is not in the position to make such a statement or commitment.

ADDITIONAL INFORMATION

Pattie Acklin requested a "decision matrix" to be made available for the council. I hope to have that completed Wednesday morning.

Cathy Golden asked that the existing operating costs for the existing plant be separated from the total costs of the proposed improvement. This will be available prior to the council meeting.

A copy of Marc Prevost's memo on his conversation with Karl Anuta (NEDC) last Tuesday is attached.

A copy of Mr. Anuta's response to the "phased" option is attached for your reference.

I have had a request to present the costs for a WWTP only improvement that would produce a class IV effluent. I hope to have that completed tomorrow morning.

A request was made for a brief study of possible ways to mitigate odors at the existing plant. Also attached is a letter from Chuck Zikefoose of Brown and Caldwell.

SMH:rm\Wtlnds\LgOption.mem

cc: Marc Prevost, RVCOG
John Davis, Woodward-Clyde
Terry Gould, Brown and Caldwell
Gary Schrodt, Ashland Wetlands Coalition

encl: Report
Supplement to Report
Prevost Memo
Letter, Hall to Anuta
Letter, Anuta to Hall
Zikefoose WWTP Odor Control Report

[redacted] SOURCE CONTROL OF WATER POLLUTANTS

Source control of pollutants in the water is an extremely important management tool for improving Bear Creek Habitat. Like water conservation, source control will affect other aspects of water management. Source control can include activities such as requiring pre-treatment of water before industrial release into the sewer, removing phosphorus from cleaning products destined for the sewer, removing the contribution from garbage grinders. Generally detergents used in laundry, showers, and dishwashers account for approximately 85% of the phosphorus in typical wastewaters. Source control efforts across the board in these areas could significantly reduce phosphorus loads to the WWTP. The effect of source control of phosphorus on treatment plant design and operation is discussed fully in Chapter 6., and sources of pollutants in the waste water flow are compared in Table [redacted] 5.1

Table 5.1 Mass Loadings (mg per day per capita), in ppm per Use, from Individual Sources

	Toilet	Shower	Laundry	Dishes	Garbage Grinders
Use Per Day	4	1	.2	1.14	1.14
BOD	23,600	17,667	7,700	13,444	47,504
TSS	30,800	11,325	5,889	6,722	66,101
Nitrogen	4,200	2,000	3,000	2,995	12,742
Phosphorus	340	1,500	1,812	1,551	501
% Phosphorus	5.9	26.2	31.7	27.1	8.7

[redacted] NPS MARSHES ALONG TRIBUTARIES

Tributary water can be used to improve the habitat of Bear Creek in at least two ways. First, the tributaries can be restored, thus removing pollutants, lowering temperatures, and increasing flows into Bear Creek. Secondly, marshes can be constructed along tributaries to partially treat tributary water and to store water for use in timed release strategies.

In the 1981 study by James M. Montgomery, Inc. for RVCOG entitles Feasibility Study of Bear Creek Greenway Passive Treatment Systems, 8 sites for non-point marshes and ponds were identified within the immediate study area for this paper (Montgomery 1981). Two of these sites were given high priority status, Ashland Pond and Beagle Mill Pond. This study indicates that Ashland Pond can be used as a treatment system for Ashland Creek. There has been some work on utilizing this capacity of Ashland Pond and waters from Ashland Creek are directed through the Pond under certain circumstances.

Beagle Mill Pond, the second site given highest priority, is a 1/2 acre site located west of Mountain Avenue south of Bear Creek. This site could treat waters from a small Bear Creek tributary and from the storm water drainage ditch along Mountain Avenue (James Montgomery 1981).

Another site identified in the Montgomery study is described as Pearson Property Marsh, and located at the southeast edge of Ashland off E. Main Street. This is part of an historical marsh area along the northern edge of Bear Creek where I-5 crosses Bear Creek. This site was identified in the Montgomery report as moderate priority site, and it was noted that the owner was interested in gravel mining, at the time of the study.

To assess the efficiency of a NPS marsh to help enhance the habitat of Bear Creek, a simple design has been developed for an available site. This marsh would be located at the site mentioned above, north of Bear Creek near where Bear Creek crosses I-5 north of the airport. It would help treat pollution entering the system via Walker Creek, Neil Creek, and Emigrant Creek. This site is near the Airport and open water habitat attracting large birds such as geese should be avoided. A dense emergent marsh, however, would not attract this type of bird and would accomplish treatment and storage functions.

The waters from Bear Creek would enter this marsh, pass through the marsh, and then be returned to Bear Creek very near the same location where it was removed. To insure that no barrier to fish migration is formed here, creek flow can be split to allow easy by-pass of the marsh by migrating fish.

This marsh includes 15 acres of solid bulrush and cattail dominated biotic community. It is constructed in a way to allow 4 feet of water to be stored in the emergent plant acreage. It also has a settling area which collects the bulk of the sediment trapped in the system and allows regular removal of this material by use of front end loader. or similer equipment.

This marsh has 45 acre/feet of storage. At a typical Bear Creek flow of 30 cfs during phosphorus compliance period, this marsh would allow a detention time of over 18 hours. During this time, phosphorus and turbidity would be reduced. At a more critical flow of 10 cfs, this marsh would offer over thwo days detention time.

Another site with potential to treat tributary water is along Ashland Creek just upstream from the treatment plant. A marsh similar to the one described above would treat waters from Ashland Creek before it enters the Bear Creek System. This marsh would be smaller (10 acres), but could include more open water areas and have a similar detention time to the marsh described above.

4.5.7 TRIBUTARY RESTORATION

Tributary restoration consists mainly of fencing grazing livestock out of the watercourse and riparian zones adjacent to the creek and by planting native species in the fenced zone. [redacted]

ble 5. [redacted] shows the expected effect of tributary restoration on phosphorus levels in Bear Creek.

ROGUE VALLEY
Council of Governments

155 S. Second Street
P.O. Box 3275
Central Point, OR 97502

503-664-6674

6 July 1993

Ashland City Council Members
City of Ashland
Ashland, OR 97520

RE: Wastewater Facilities Plan Addendum, June 1993

Dear Council Members:

At 4:30 P.M. tonight I phoned and talked with Carl Anuta of Northwest Environmental Defense Council (NEDC) to discuss his thoughts on the City of Ashland's staff recommendation to the City Council that they adopt the staged option of B-1. I read portions of the document to Mr. Anuta and specifically asked him how he thought NEDC would react to such a proposal.

Below is my interpretation of my discussion with Mr. Anuta:

Mr. Anuta explained that he is aware of the problem the City of Ashland faces with trying to meet water quality standards in Bear Creek while at the same time trying to maintain critical summer flows. He noted his understanding of how the city's wastewater flows are an important component of creek flow during most of the summer low flow period.

In response to my question, Mr. Anuta noted that if the City were to argue whether DEQ used best science in developing their phosphate criteria of 0.08 mg/l then "NEDC would not be very sympathetic to this argument." However, if the city were to state that because of their unique situation (in that their wastewater is necessary to maintaining the flow in Bear Creek) they decided to take a staged approach in their facilities plan as an honest effort to meeting the water quality standards while trying to maintain creek flows, then NEDC would be inclined to recognize this as a "good faith effort." He stated that "NEDC recognizes Ashland's need for creative solutions" in meeting the problem facing them and "NEDC does not support meeting water quality standards by simply removing the water from the creek and sending it to Medford."

Mr. Anuta stated that NEDC could support DEQ in allowing the city to undertake this staged approach provided that this is an honest effort to meet the requirements of the Clean Water Act. He made this statement even though I had already explained to him that there is a good possibility that the wetlands might not fully meet the 0.08 mg/l phosphate allocation.

CITY OF ASHLAND CITY HALL
ASHLAND, OREGON 97520
telephone (code 503) 482-3211

July 7, 1993

Mr. Karl G. Anuta
Jolles, Sokol and Berstein, P.C.
721 S.W. Oak Street
Portland, Oregon 97205

Re: Ashland Facilities Plan

Dear Mr. Anuta:

Thank you for taking the time to speak with me today about Ashland's proposal for a phased or staged construction option to meet mandated instream standards imposed by the DEQ and EQC.

Attached is a copy of the Ashland Wastewater Facilities Plan Addendum that outlines several options the Ashland City Council is considering. The options include the use of constructed wetlands as a major component of the wastewater treatment plant (WWTP) upgrade.

I appreciate your willingness to meet with the City of Ashland to discuss our proposal as your schedule will allow.

If you have any questions about the plan, please contact John Davis at Woodward-Clyde Consultants in Portland (222-7200) or myself (482-3211, cellular 944-3389).

Sincerely yours,

Steven M. Hall

Steven M. Hall, P.E.
Public Works Director

SMH:rm\Sewer\Wtlnds\Anuta.ltr

cc: Rob Winthrop, City Council Liaison
John Davis, Woodward-Clyde Consultants
Marc Prevost, Rogue Valley Council of Governments

encl: Facilities Plan Addendum

JOLLES, SOKOL & BERNSTEIN, P.C.
ATTORNEYS AT LAW

BERNARD JOLLES
LARRY N. SOKOL
HARLAN BERNSTEIN
MICHAEL T. GARONE
EVELYN M. CONROY *
KARL G. ANUTA *

* ALSO MEMBER OF WASHINGTON STATE BAR

721 SOUTHWEST OAK STREET
PORTLAND, OREGON 97205-3791

TELEPHONE
(503) 228-6474
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July 8, 1993

A.M.H.

Steve Hall
Public Works Director
City of Ashland
Ashland, OR 97520

VIA FAX 488-5311

RE: Bear Creek TMDL & Ashland Facilities Plan

Dear Steve:

Thanks for forwarding a copy of your plan. It has some interesting ideas.

It appears I will be in trial all next week. Consequently, I will not be able to meet with you then. I should be available the following week, if you think it would be useful to get together here. I am open on Monday afternoon and all day Tuesday. I would be happy to give you an hour or two during either period.

As I told you, NEDC favors creative solutions to the water quality-water quantity problem on Bear Creek. How to best mesh flow with water quality cleanup requirements is a difficult, but not presumably insurmountable challenge. **However**, NEDC would oppose any approach that is focused on disputing (either now or in the future) DEQ's "science" in setting a particular Waste Load Allocation. The idea is to come up with a creative way to clean up, not to challenge the necessity of a cleanup.

In our discussion, you indicated that the proposed phased approach would involve a study of Bear Creek. Such a study would undoubtedly be useful, <u>but only</u> if it is an objective study of what is there and what can be done to make it better. A study which has as either short- or long-term goals, a challenge to DEQ's conclusions on TMDL limits is **<u>not</u>** acceptable. The study outlined by Woodward-Clyde in your current Addendum edges in that direction, and is, therefore, of concern. This could probably be fixed with appropriate instructions on the scope and purpose of the study, fashioned by DEQ.

I hope this makes NEDC's initial thoughts on the issue clear. I look forward to working with you further. If you have any questions, please do not hesitate to contact me.

Sincerely,

Karl G. Anuta

KGA:

c: Marc Prevost, Rogue Valley Council of Govt.
Neal Mullane, DEQ Water Quality

Brown and Caldwell
Consultants

9620 S.W. Barbur Boulevard
Suite 200
Portland, OR 97219-6041
(503) 244-7005
FAX (503) 244-9095

RECEIVED JUL 06 1993

July 1, 1993

Mr. Steve Hall
Public Works Director
City of Ashland
20 East Main Street
Ashland, Oregon 97520

13-4384

Subject: Ashland Wastewater Treatment Plant Odor Control

Dear Mr. Hall:

This letter identifies potential odor sources at the existing treatment plant and discusses how the recommended improvements for the on-site treatment alternative would significantly reduce the number of potential odor sources. Additional steps that could further reduce odor sources are also discussed. It is important to note that whether or not these potential odor sources within the plant would cause noticeable odors outside of the plant boundaries is dependant on many factors including meteorological conditions, influent wastewater characteristics, distance of the odor sources to the plant boundary, and even landscaping and topography of the plant site. Additional study would be required to gather site specific information, set odor design criteria, and determine the need for and effect of additional plant enhancements.

Potential Odor Sources at Existing Treatment Plant

Our review of the existing treatment units at the plant shows that the following units could be potential odor sources.

Influent Pumping Station. The influent pumping station is located just outside of the plant boundary. The pumping station wet well is ventilated by a fan that discharges to the atmosphere. The wastewater in the wet well apparently has dissolved oxygen content such that sulfide odors are not formed. There is a slight musty smell normally associated with wastewater; however, there are no nearby residences that would be affected by this odor.

Headworks. Two influent force mains and one gravity interceptor enter the headworks influent channel. The facilities plan states that there can be significant turbulence in this channel. If sulfides are present in the wastewater, the turbulence could cause odorous gases such as hydrogen sulfide and reduced organic sulfur compounds to be released (or stripped) from the wastewater into the atmosphere. At present time, the wastewater apparently has a dissolved oxygen content such that sulfide odors are not formed. Additional investigation would be required to determine if there are times when sulfide odors could be present particularly during hot weather.

The existing "Detritor" grit removal tank has overflow weirs to maintain a relatively constant level in the tank. Effluent from the tank cascades over the weir and into two parallel channels. Sulfide odors, if present, could be released at these locations due to the turbulence.

Grit that is removed from the wastewater is dewatered in a screw-type conveyor and collected in 55-gallon drums. The dewatering facilities are a source of odor since there is a buildup of solids along the conveyor flyghts. The storage drums are covered and therefore are not normally a major odor source. A mist system has been installed near this location to mask odors with vanilla deodorizer. The transfer of drum contents does produce odors, it is advisable to add lime to the contents if stored for more than 48 hours.

The two channels each have a barminutor which shreds rags and plastic material and returns this material to the wastewater stream. Turbulence at the barminutors could provide for release of sulfur odors if present. Since material is returned to the wastewater rather that removed, there would not be any odors caused by solids handling at this treatment unit.

Primary Clarifier. During summertime operation several factors could cause the primary clarifier to generate significant levels of odors. Reduced flows during dry weather will provide long detention times in the primary clarifiers and the warmer temperatures cause a high level of activity in the bacterial population in the primary clarifier sludge. Some odor release could occur as gaseous compounds are released from the sludge blanket in the clarifier and bubble to the surface. Additional odors could be released due to turbulence caused by the wastewater cascading over the clarifier weirs. At this time, the odors at the primary clarifier appear to be relatively minor despite the potential for formation of odors. This condition is predicted to worsen as loading increases.

The clarifier's scum pit has a grated cover and is a source of odors during warm summer months. Even daily pumping of the pit would not normally be enough to eliminate the potential for odor.

Aeration Basins. If dissolved oxygen concentrations are maintained in the aeration basins, sulfur compounds will be quickly oxidized and sulfur odors will not occur from these basins and downstream processes. However, volatile organic compounds (VOC) will be released to the atmosphere due to the agitation caused by the aeration equipment especially mechanical aeration equipment as currently exists at the plant. Possible future regulations could restrict the emission of VOCs and require covering of the aeration basins. These regulations are currently planned for large metropolitan areas and may not apply at this location. Low dissolved oxygen content in the summer will cause both odor potential and reduced biological efficiency.

One of the existing aeration basins is currently used for storage of aerobically digested sludge. There is no aeration equipment for maintaining aerobic conditions in the basin and the sludge has gone septic. Currently, this is a major source of odors at the plant. The basin will be pumped out.

Secondary Clarifiers. As mentioned above, dissolved oxygen concentrations in the wastewater downstream from the aeration basins will prevent the release of sulfur odors. Therefore, the turbulence at the effluent weirs of the secondary clarifiers should not cause significant odor release. The scum pit adjacent to the clarifiers also does not appear to be a source of odors at this time.

Chlorine Contact Tanks. Currently, the chlorine contact tanks are alternately drained and cleaned every other week and the effluent is pumped back to the headworks. There are odors released during the cleaning of the tanks due to algae growth.

Sludge Digestion. Both aerobic and anaerobic digestion are used at the treatment plant. In general, the primary sludge is digested anaerobically and the secondary sludge is digested aerobically. The anaerobic digestion process is not expected to release odors. Occasionally the flame at the waste gas burner goes out during high wind which allows the release of gaseous odors.

The aerobic digestion process can release significant odors particularly during the decanting process and during periods of high loading.

Sludge Storage. The plant has a modified Imhoff tank that is used for aerobic and anaerobic sludge storage. The tank is covered and odors are contained within the tank.

Sludge Dewatering. Sludge is currently dewatered in sludge drying beds where the sludge is spread out in a thin layer and allowed to dry. Obviously, this process can produce odors which at times, particularly in the spring, could be significant.

Conditions After Improvements Recommended in the Facilities Plan

The facilities plan suggests that a viable alternative for providing for the treatment of Ashland's wastewater would be on-site treatment at an expanded plant with winter discharge to Bear Creek and summer effluent spray irrigation. The recommended improvements for this alternative would significantly reduce the number of potential odor sources at the plant. Additional improvements could be implemented if additional study shows that remaining potential odor sources would cause odors outside of the plant boundaries. Each treatment process is discussed below.

Influent Pumping Station and Headworks. As discussed above, the influent pumping station does not pose an odor problem. However, the grit dewatering and storage facilities are known odor sources at the headworks. A building could be constructed over these facilities. The building would be ventilated to provide for safe working conditions and the foul air would be scrubbed of the odorous compounds by either chemical, adsorption, or biological processes. These improvements will be added to the recommendations in the facilities plan.

If additional study shows that sulfides are present, areas where there are turbulence could allow sulfide odors to be released. This would require that additional channels be covered and ventilated to prevent corrosion. An alternative would be to provide upstream treatment in the collection system. This could include chemical addition, such as chlorine or iron salts, to oxidize hydrogen sulfide. These chemicals would not oxidize all odorous compounds and some odors would remain.

Primary Clarifier. If additional studies show that the primary clarifier could be a source of odors during dry weather flow periods, the clarifier would need to be covered and the foul air routed to an odor treatment system. A flat cover on the primary would be the most viable option since it would minimize the amount of foul air to be treated. An interim step might be covering the effluent launder. The scum pit should be covered with a removable hatch or plate to contain odors as part of the recommended improvements.

Aeration Basins. The facilities plan recommends that additional aeration basins be constructed to increase capacity and that full floor coverage fine bubble diffusion equipment replace the mechanical aerators in the existing tank. These improvements would significantly reduce the potential odors from this process. If future regulations are enacted to require the reduction of VOCs, the basins would need to be covered and the foul air treated.

Secondary Clarifiers. As discussed above, the secondary clarifiers do not pose an odor problem.

Chlorine Contact Tanks. Odors are present during the draining and cleaning of the chlorine contact tanks. The odors are primarily due to the algae growth. Continued regular cleaning of the tanks prior to severe algae growth or buildup of secondary solids should keep the odors to a minimum. Possibly the tanks could be covered to reduce algae growth; however, the covers would make cleaning of the tanks more difficult.

Sludge Digestion. The recommended improvements include a new anaerobic digester. The existing aerobic digester would be taken out of service. These improvements would eliminate the potential odors from the sludge digestion process.

Sludge Storage and Dewatering. An off-site facultative sludge lagoon (FSL) would be constructed as part of the recommended facilities including a sludge pumping station and force main to convey the sludge to the lagoon. A properly designed and operated FSL does not have significant odors since a water cap is maintained over the stabilized sludge. The solids in the FSL would be thickened in the lagoon such that additional dewatering would not be required. Some odors would occur during sludge dredging operations; however, the odors should not be a problem since the solids would be very stable and the FSL would be in a remote location.

Additional Improvements

The improvements recommended in the facilities plan will eliminate the most severe odor problems at the existing plant. The grit dewatering and storage area at the headworks will be enclosed and the air scrubbed of the odorous compounds.

Until the recommended improvements are constructed, there will be treatment units at the plant that will produce odors. The odor masking system at the headworks should remain in service until an enclosure is constructed. A temporary cover should be installed over the primary clarifier scum pit. The existing aeration basin that is currently being used for storage of sludge will eventually be pumped out; however, a temporary inexpensive cover could be installed over the tank to reduce odors until the tank is cleaned. Light weight covers could also be installed over the chlorine contact tank to reduce algae growth and reduce odors during cleaning. Lime or soda ash should continue to be added to the sludge drying beds to reduce odors when required.

Additional odor sources that could remain after construction of the recommended facilities include areas of wastewater turbulence at the headworks and the primary clarifier. Additional study would be required to determine if sulfides would be released in these areas. The chlorine contact tanks will require continued maintenance. Also, control of VOCs would require the covering of the aeration basins if required by future regulations.

The available treatment options for reduction of odors from foul air ventilated from covered areas would include chemical, adsorption, and biological processes as described below.

Chemical Scrubbers. Chemical scrubbers include recirculating liquid packed bed scrubbers and atomizing mist systems. Odorous air is passed through a spray of chemical solution designed to remove the odorous gas constituents before discharging the air to the atmosphere. This alternative provides good removal efficiencies and is very economical. The disadvantage of this alternative is that there is a potential for a chlorine-like odor in the treated air and future regulations could control the emissions of these combined chlorine compounds. A second stage system consisting of a packed bed with hydrogen peroxide to oxidize the chlorine odors or an activated carbon adsorption system may be required.

Activated Carbon Adsorption System. Activated carbon adsorption has been used extensively in wastewater treatment plants for odor control. Odorous air is passed through a bed of activated carbon and odorous constituents attach to surfaces within the pore spaces of the carbon. This system has a capital cost similar to chemical scrubbers. The operation and maintenance costs are high due to the need for high head fans and the costs associated with carbon regeneration. If additional study showed that only the grit handling area of the headworks required treatment of odors, the activated carbon adsorption system would be a good choice and is what will be included in the facility plan recommendations.

Biological Systems. Biological systems can be either liquid-based or have bulk-solid organic media. The bulk-solid organic media systems have been used during recent years and are proving to be very economical and have good removal efficiencies. The odorous air is routed through a media composed often composed of bark chips, compost, and organic peat. Crushed oyster shells are often added for pH adjustment. Odorous compounds attach to the surface of the particles and are eventually oxidized by biological organisms. A humidifier is required for the foul air intake and a sprinkler system may be required above the bulk media in order to insure adequate moisture for biological activity. The hydrogen sulfide levels in the foul air must be low enough so as not to harm the organisms in the media. Therefore, additional testing would be required to estimate foul air characteristics and determine the effectiveness of this system. This method is worth considering because the overall capital cost could be one third to one half the cost of a chemical scrubber system. Also, the system uses biological processes rather than chemicals and is constructed of readily available materials.

Further Action

This letter report was prepared to briefly describe the potential odor sources at the existing plant, the significant reductions of odor sources that would be attained when the recommended improvements are constructed, and additional improvements that could be made to further reduce odor sources if required. Additional study would be required to determine the need for and effectiveness of additional improvements. The additional studies would include gathering of meteorological data, testing for dissolved oxygen and sulfides in the wastewater, and testing of sulfides and other odor constituents in the atmosphere at the various process units of concern. Please contact us if you have any further questions about odor control methods at the plant.

Very truly yours,

BROWN AND CALDWELL

Chuck Zickefoose
Regional Department Manager

BKP/CSZ:jlj

ASHLAND WASTEWATER FACILITIES PLAN ADDENDUM

SUPPLEMENTARY INFORMATION

BACKGROUND

The originaal wastewater faccilities plan addendum was precipitated by an extra ordinary meeting of the city council of Ashland, Oregon, in September, 1992. The City was under a Stipulation and Final Order from the State of Oregon Department of Environmental Quality (DEQ) to submit (in less than four months) a final facilities plan for the City's wastewater treatment plant (WWTP). After 2 years and a quarter million dollars spent, the planning process was in disarray, and the mandated deadline was rapidly approaching. The upgrade alternatives which had appeared to be right on track had suddenly become perceived as making little sense.

This was due to a series of small and large events, which together changed the way the City decision makers perceived the treatment system problem and the possible solutions. Some of these events are described below.

Shortly (approximately 3 months) after the original facilities plan study (Brown and Caldwell, 1991) was accepted by the City, in April, 1991, another study, the Synergic Resources Corporation (SRC) report, was prepared. This report (SRC,1991) was adopted by the City Council in April, 1992, and it was remarkable in at least two ways. Primarily, it developed a common sense and economical program whereby the City could save over one-half million gallons of water per day, by applying water conservation technologies and practices. This program would allow avoidance or delay in building a new supply water treatment plant upgrade and would help keep water in the natural tributaries and creeks.

The City eventually did fund the water conservation measures developed in the SRC report as part of a ten year effort, starting with fiscal year 1992-1993. This was a period of very high awareness of the continuing drought in the region. The Ashland citizens were quick to embrace the program.

By the end of 1992 there had been nearly 250 water audits in Ashland buildings, and over 200 water conservation measures had been taken, including installation of 70 ultra-low flow toilets. (Wanderscheid, 1993) On January, 1993, there were 535 people signed up and waiting for audits.

The water flows through the wastewater treatment plant during 1992 were significantly below the flows of previous years, even after accounting for infiltration from the ground into the collection system during wet years. This reflects the low water use during this time and was due more to the citizen awareness and volunteer action than to the City's audits and measures, which had only just begun to operate. This level of use reflects what the citizens are willing to accept as water conservation sacrifices, and after the ten year program of water conservation measures is complete, a great deal more reduction will be possible.

The second event precipitating the need for a wetland alternative study was the awareness by many in the Ashland community that the treated water from the plant was a resource and a necessary part of the tributary and creek system flowing through Ashland and along the Bear Creek. The original facilities plan report recommended alternatives which removed flows from Bear Creek. This volume of water (approximately 3 cubic feet per second, or cfs) flowing into the creek 24 hours per day is essential to fish habitat in times of low flow. By the time the City Council met in late 1992, they realized that one of their goals in the project was to enhance the habitat of Bear Creek.

A third very significant event unfolded during this time. The Talent Irrigation District (TID) water exchange potential completely reversed since the original facilities plan was done. Then (Brown and Caldwell 1991) it was stated that TID was not interested in an exchange, and therefore it was not considered feasible. Since then TID has embraced the concept of an exchange or re-use of treated effluent in its system. (TID, 1993) The ability to incorporate TID exchange into an effluent management program opens up many more possibilities for upgrade design, including the possibility of reducing the size of expensive phosphorus removal units.

ASHLAND'S GOALS AND CONCERNS

On October 22, 1992, the Ashland City Council adopted a goal statement regarding the treatment plant upgrade. This statement embraced the concept of using open surface wetlands technology for reaching the following goals:

Satisfy Oregon Department of Environmental Quality (DEQ) standards for releases from the treatment plant.

Replace the volume of effluent removed from Bear Creek .

Support the natural ecology of Bear Creek.

Minimize capital and operating costs of the treatment plant (City Ashland, 1992).

Multi-objective open surface wetlands technology, as described to the City Council by Dr. Gearheart, is a natural processe, waste-water treatment technology which provides multiple benefits beyond treating the wastewater. These benefits include wildlife habitat, open space, passive recreation, environmental education, and many others.

Some details of the City's goals are revealed in the November 9, 1992 request for proposals (RFP) for a wetland alternative feasibility study. This RFP states that the City wishes to develop a set of management strategies to use in combination with flow control from a constructed wetland system to enhance the habitat of upper Bear Creek. The City also wishes to understand how the various land uses in the upper Bear Creek watershed contribute to the phosphorus loading in Bear Creek, and how water supply conservation and management will effect treatment plant design.(Ashland , 1992b).

These proposed wastewater goals indicate a realization by the City policy makers that efficient management of the City's water and wastewater necessitates an awareness of the character of the whole watershed and the activities taking place there.

The Ashland Wetlands Coalition, representing the citizens of Ashland who initiated the City's re-consideration of using wetlands technology, seem to be especially interested in habitat, recreation, and educational objectives, as well as water treatment objectives. Some Coalition objectives, as stated in their October, 1992 statement include:

Insure that treated water temperature is equal to or less than that of Bear Creek;

Maximize the creation of new wildlife habitat through new wetlands construction;

Develop a treatment facility which creates a scenic wetlands park, wildlife habitat, and an example for other Oregon cities to follow.

Evaluate the incorporation of storm drain flows from the city through multi-reservoir open surface wetlands;

Incorporate a possible exchange with the Talent Irrigation District to ensure the highest quality and quantity of water flows to Bear Creek during dry summer months (Wetlands Coalition, 1993).

A hierarchal list is shown below. The goal on the top (Meet DEQ standards) is considered primary priority and is met before the remaining goals are met. The lower goals, also, are to be satisfied before the goals under them become priority.

1. Meet DEQ Standards
2. Flow and Temperature to Bear Creek
3. Park, Recreational, and Open Space Benefit
4. Water Reuse

Water reuse, although not stated as one of the goals, is the last element in a standard total watershed approach. Reuse is the other side of conservation, which is the standard way to begin a total water management program approach.

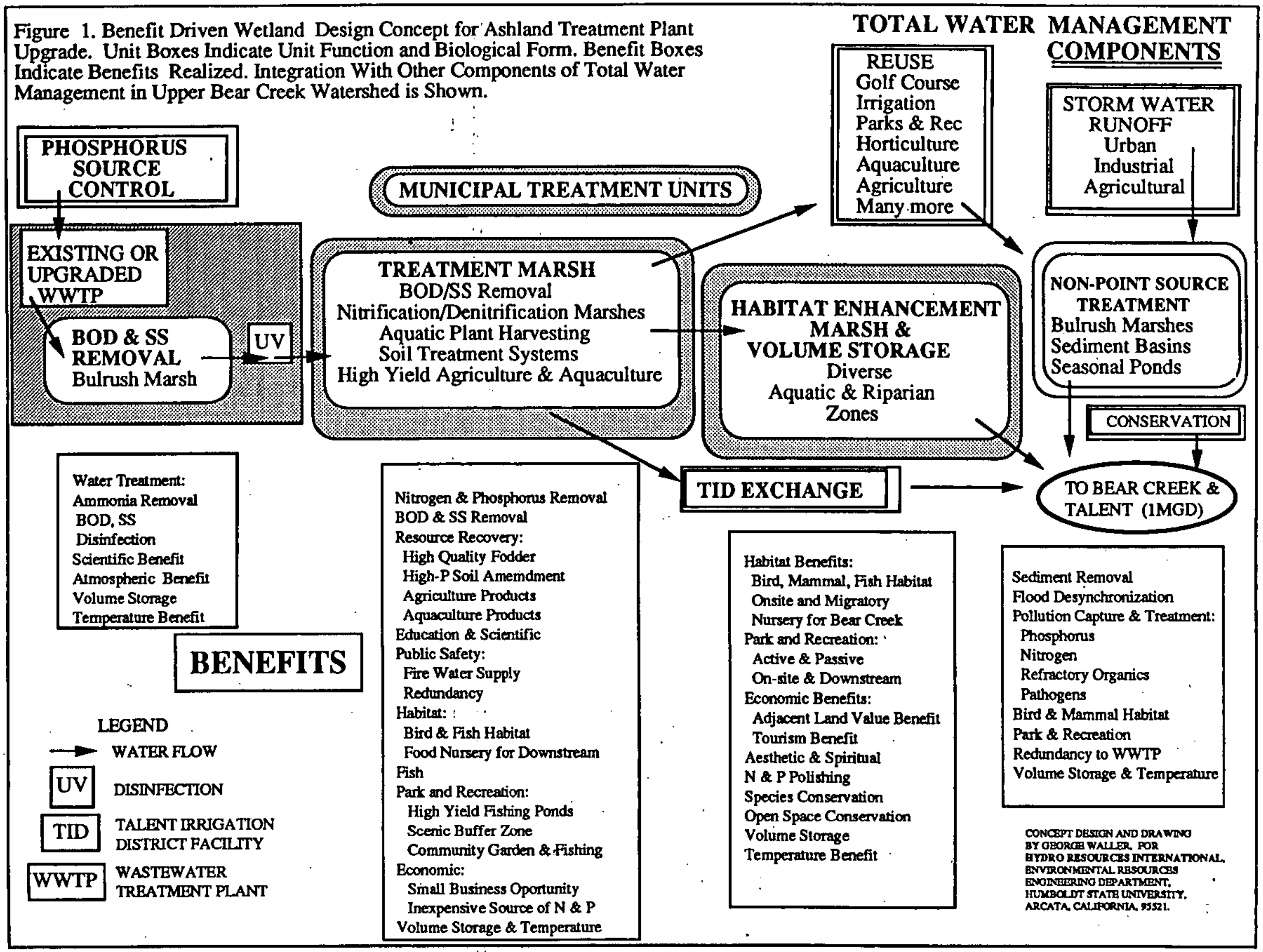
Potential benefits for the City of Ashland are shown in Figure 1. This concept chart was constructed from a set of general wetland benefits developed at Humboldt State University for economic analysis of constructed wetlands. In addition to the goals formally stated by the Ashland City Counsel and the Ashland Wetland Coalition, other benefits will likely occur and accrue. These additional benefits include: emergency fire suppression water supply capabilities, economic benefit from increased tourism, resource (nitrogen and phosphorus) recovery potential, reduction in cost of conventional portion of upgrade, and Redundancy to WWTP. This latter benefit refers to the capability to design a marsh system which will store effluent during a treatment plant breakdown, allowing extra time for repairs, and protecting the creek from spills.

The shaded boxes in Figure 1 are City owned and managed treatment units such as the existing treatment plant and any constructed marshes or other natural process systems utilized in the upgrade. These units are described in more detail below. The white boxes below these unit boxes list the benefits which can be realized from the treatment units. The unshaded double-boxes are water management practices other than treatment units, which can be utilized to meet water quality goals, Bear Creek habitat goals, park and recreation goals, open space goals, and resource recovery goals.

These treatment units and their function are briefly described here and described in more detail in a specific design alternative designated alternative B-3. The first unit is the wastewater treatment plant (WWTP). At the wastewater treatment plant, water is treated: solids, suspended solids, and BOD, are removed; ammonia is transformed to nitrate, and dissinfection occurs.

From the treatment plant, water flows to a Treatment Marsh unit. The plant zones in this unit are 90% bulrush/lemna plant community, and 10% open water community. The treatment marsh unit may have recirculating capability and water storage capacity. It accommodates recreation trails and creates bird habitat. If high yield resource recovery (through growing fish, hay, trees, vegetables, harvestable aquatic plants) is to be utilized, the water entering this stage is particularly suited, as it is richest in resources. Of the land and water forms for this type of unit, approximately 30% are dikes, riparian, trails, and access routes; 65% are emergent marsh zones; 5% are open water zones. Benefits from this unit are shown in Figure 1.

Figure 1. Benefit Driven Wetland Design Concept for Ashland Treatment Plant Upgrade. Unit Boxes Indicate Unit Function and Biological Form. Benefit Boxes Indicate Benefits Realized. Integration With Other Components of Total Water Management in Upper Bear Creek Watershed is Shown.



The final unit of the benefit driven wetland design concept is a polishing and storage zone, designated Habitat Enhancement Marsh and Volume Storage in Figure 1. Storage may be needed to allow for timed releases into the receiving stream. Treatment continues during the storage period, and can be enhanced if recirculation is used.

This volume and polishing zone is an opportunity for more ecological diversity. Open water and marsh areas can be woven with riparian recreational and open space areas. These zones may not need to be strictly treatment oriented and, as such, have more latitude for creative design and function. Timed water releases from these areas may play an important part in the developing water management strategy.

At a meeting on 6 July, 1993 the Ashland City Council directed the WCC team to provide information on an alternative wastewater management system suggested by the Wetland Coalition. The alternative would involve the use of a large constructed treatment wetland (100-150 acres) in combination with the existing treatment plant. Such an alternative was considered earlier in the analysis but was rejected as less advantageous than other available alternatives. Information on the alternative, is provided below. It is referred to as Wetlands Alternative B-3. For the purpose of this alternative we have designated 90 acres for treating effluent from the secondary treatment and approximately 30-40 acres for treating NPS sources of contamination in the Bear Creek watershed.

SYSTEM COMPONENTS

The components of wetlands alternative B-3 would be as follows:

- The existing WWTP would receive a minor upgrade. It would be modified to operate reliably and accommodate projected future flows until 2015. The existing effluent chlorination system would be abandoned and replaced with an ultra-violet light disinfection system. The upgrade would include improvements to produce an ammonia effluent from the plant of 6 mg/l, and also immprovements to the sludge handling system made necessary by the U.S. EPA's new sludge regulations.

- A multi-celled constructed wetland with a water surface of 60 acres would be built downstream of the upgraded plant.

- Discharge to Bear Creek would not be stopped.

- Total watershed management strategies including water conservation and phosphorus source control, will be utilized.

COMPLIANCE WITH STANDARDS

Effluent quality produced by Alternative B-3 is compared to effluent limits for discharge to Bear Creek in Tables 1 & 2. Source control for phosphorus could reduce the phosphorus concentration from the treatment plant to 2.3 mg/l. Water conservation would reduce the design flows of the treatment plant to 1.8 to 2.0 MGD. The combination of the two could reduce the phosphorus load from the treatment from 80 lbs/day to 26 lbs/day.

TABLE 1 Compliance with Summertime Standards

Constituent	Allowable Effluent Concentration (mg/L)	Water Quality (mg/l)		
		Wetland Alternative B-3	Wetland Alternative B-1	Wetland Alternative B-2
Total Phosphorus	0.08	background	2.1	2.1
Carbonaceous BOD	3.0	<3.0	3.0	5.0
Carbonaceous BOD and Nitrogenous BOD	6.75	<6.0	5.17	45.5
Ammonia	0.55	0.25	0.5	9.3
Residual Chlorine	0.025	0.0	<0.01	<0.01

TABLE 2 Compliance with Wintertime Standards

Constituent	Allowable Effluent Concentration (mg/L)	Water Quality (mg/l)		
		Wetland Alternative B-3	Wetland Alternative B-1	Wetland Alternative B-2
Total Phosphorus	no standard	2.1	2.1	2.1
Carbonaceous BOD	<7.8	3.0	3.0	5.0
Carbonaceous BOD and Nitrogenous BOD	7.8	7.3	5.17	45.5
Ammonia	1.88	1.0	0.5	9.3
Residual Chlorine	0.021	0.0	<0.01	<0.01

Because the storage available in the wetlands would be large, the city would have the option of discontinuing discharge to the creek when effluent limits cannot be met during the entire commpliance period. Usually, the most stringent criteria occurs when the wetland is performing at high rate in terms of treatment, and wetland effluent can be used to augment the creek during these times. At other times, the practice of holding back treated effluent from Bear Creek will have to be accompanied by flow augmentation if a base flow of 10 CFS is to be maintained in Bear Creek. Water saved in Ashland's water conservation program would remain as low flow augmentation to Bear Creek during these times also.

ESTIMATED COSTS

The estimated capital costs of Alternative B-3 are shown in Table 3. The feasibility and cost of alternatives that include wetlands are subject to some uncertainty because the favored wetlands sites have not been subject to a detailed geotechnical analysis. Borings will need to be taken to determine the depth to rock at various parts of the sites. Until such an analysis is performed, some doubt about the constructability of wetlands at the preferred site remains.

TABLE 3. CAPITAL COSTS OF ALTERNATIVE B-3

A. Influent Sewer		100,000
B. Intermediate Pump Station	1 @	200,000
C. Force Mains	1 @	200,000
D. Wetlands (90 total - 60 wet)	1,303,500x60/25	3,128,400
E. Outlet Works		325,000
F. Outfall		236,300
G. Electrical/fencing/roads/seeding (90-60)-Item D		708,000
H. 90 acres @ 5,000		450,000
	Subtotal	$5,345,700
	Total x 1.1	$5,880,270

THE ROLE OF FREE SURFACE CONSTRUCTED WETLANDS FOR ASHLAND

1. Wetland temperatures will be 5-7°C cooler than the stream during the hottest months of the year. This would result in a 3-4°C reduction in the stream temperature downstream from the discharge.

2. Given an effluent ammonia level of 2 mg/l from the secondary treatment, the ammonia level will be less than 1.0 mg/l in winter and 0.25 mg/l in summer in a wetland of 25 acres. In a wetland of 60 acres, an effluent ammonia level of 5 mg/l from the secondary treatment will result in a wetland ammonia level less than 1.0 mg/l in winter and 0.25 mg/l in summer.

3. A 25 acre wetland will afford a significant treatment buffer if for some reason the secondary systems malfunction. Secondary discharge BOD and SS levels of 40-75 mg/l would consistently be reduced to less than 5 mg/l each with a 25 acre wetland.

4. A 25 acre wetland will reduce a secondary treatment system effluent of 2 mg/l phosphorus (as soluble reactive) to 1.25 mg/l ± 0.25 mg/l on an annual average. In the growing season (April - September) the phosphorus level will be between 0.2 and 0.5 mg/l.

5. In a 60 acre wetland the phosphorus levels would be between 0.05 and 0.10 mg/l during the growing season. No chemicals, energy, or filtration equipment is required for wetland phosphorus removal. No inorganic sludge is produced.

6. A 25 acre wetland would be able to store approximately 9 days of flow at 1.8 MGD or about 5 days at 3.6 MGD. A 60 acre wetland would be able to store 21 days of flow at 1.8 or 10 days at 3.6 MGD. Since storage would normally be required during the drier period the larger numbers for storage days would probably apply.

ALTERNATIVE B3

A possible design utilizing approximately 90 acres has been developed to investigate costs of implementing a constructed wetland alternative for Ashland's treatment plant upgrade. This design consists of 60 acres of wetland acreage (including 10 acres of open water habitat), and 30 acres of enhanced, however, and trails with bird blinds can be constructed directly adjacent to this marsh if a posted fence is placed between.

Disinfected effluent from the UV unit flows into a gravity flow pipe and is transported approximately 800 feet to a point just downstream from Ashland Pond. Here a meandering ribbon marsh or a series of wide, vegetated channels slowly transport the water through the Billings marsh site and the Wright's Creek site . These marshes comprise about 10 wetland acres may be designed in many creative and aesthetic forms to compliment the golf course development planned for this area.

From Wright's/Billings Marsh, water will gravity flow to an adjacent pump station. This pump station is in a location where disinfected water can be pumped to the other marsh sites in the system, pumped elsewhere for reuse, or released from this point to Bear Creek (see map in Appendix A). This location also offers the flexibility to blend water from Wright's Marsh with water coming from the other marshes in the system prior to release to Bear Creek, and also allows for recirculation of water through one or more of the other two marshes (44 acres of marsh and open water).

The water is pumped through a force main to release points for the two remaining marshes in the system. These two marshes can be isolated from the flow for repair or service and can be implemented incrementally. These marshes carry high quality disinfected water and offer excellent multiple benefits.

The first release point from the force main is approximately 1000 lineal feet from the pump, with an elevation rise of about 70 feet. This point releases into Butler Marsh East, described in Appendix A. The second release point is approximately 600 feet farther along the force main and is less than 15 feet higher in elevation. This second point releases water into Butler Marsh West.

Butler Marshes East and West are multi-objective, open surface marshes. They comprise about 32 acres of emergent marsh, 12 acres of open water, and about 28 acres of riparian and upland areas. Their primary goal will be to treat and store effluent, but they will provide nearly all the multiple benefits discussed in the goals section of this paper, including education, recreation, open space, habitat, and tourist related goals.

Butler Marshes East and West have over 100 acre feet of storage, allowing for 17 days storage of average dry weather flow. The water in these marshes has been disinfected and will be a high quality water, suitable for supporting public recreational use or high-level irrigation. Turbidity in all parts of Butler Marsh is expected to be less than that in Bear Creek or Ashland Creek. BOD and SS concentrations of effluent will be less than 8 ppm.

These marshes have excellent potential for meeting multiple benefits enjoyed both by local people and by visitors arriving via I-5. There are points where Bear Creek Greenway trails can conveniently connect into Butler Marsh trails, and good road access to parking areas off Valley View Road and Butler Creek Road. These marshes will afford marsh and open space views from motels and tourist facilities on the south side of Valley View Road and from I-5.

These last two marshes (Butler East & West) gravity flow drain back to the pump station, where water can be blended with incoming water, pumped for reuse, or released to Bear Creek.

The management scheme associated with this design calls for storing the water during seasons when release might endanger fish habitat in Bear Creek. The total system described above allows for storage of 150 acre feet of water, or 25 days at average dry weather flow. During the periods of storage, water can be recirculated through 100 acre feet of the storage volume.

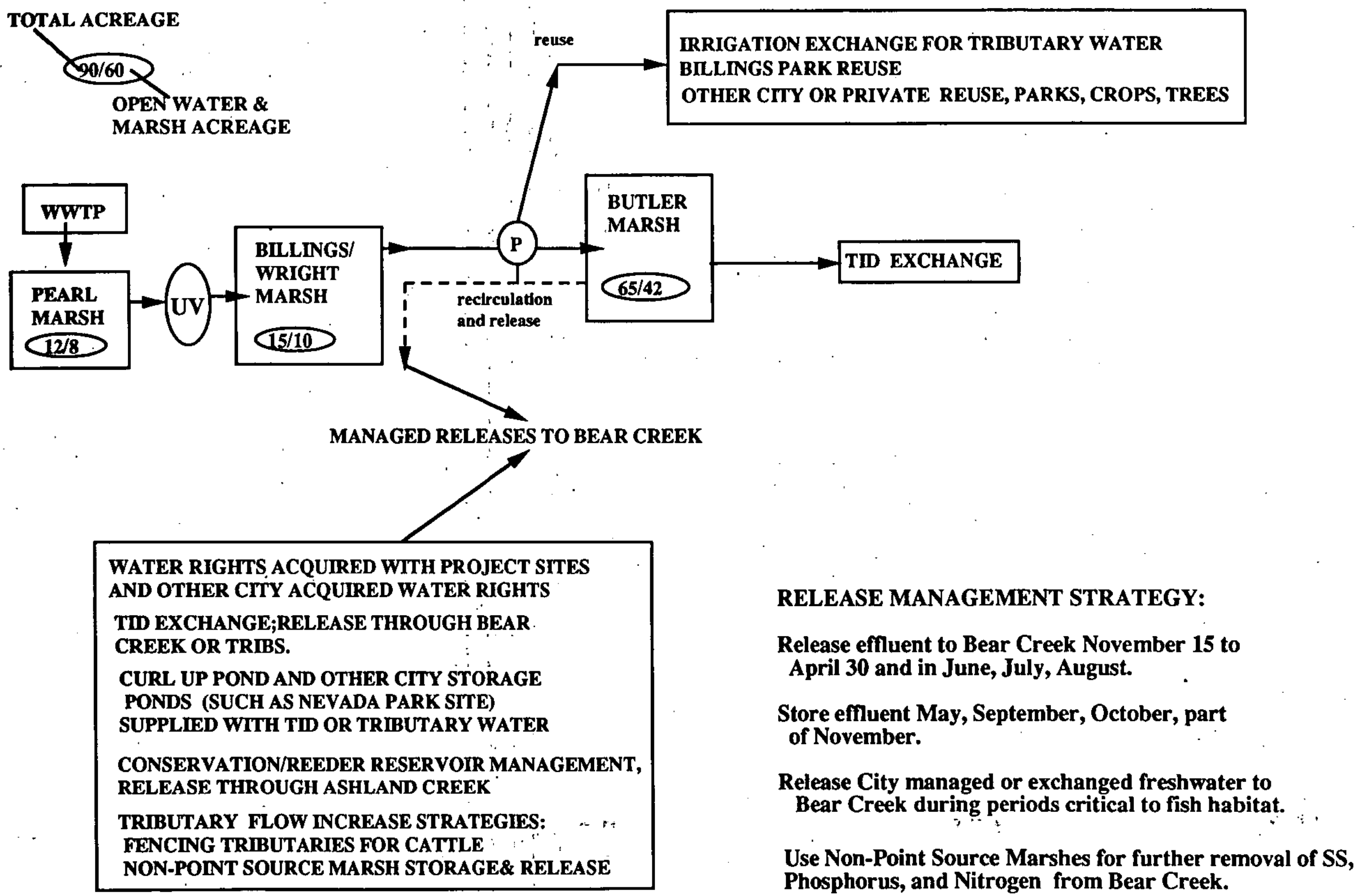


Figure 2. Concept Design and Release Stratetgy for Wetland Alternative B3

Phosphorus releases can be timed in the following way to meet the existing phosphorus criteria. From May 1 until the growing season is sufficiently developed to produce a phosphorus limiting marsh (normally by June 1), water is stored in the system. Once the marsh limits the phosphorus to criteria levels, water releases to Bear Creek begin. Water release continues until phosphorus levels in the water increase due to the changing season (September). At this time water is stored in the marsh system, Bear Creek habitat is maintained by releases from other units in the watershed management plan, including Emigrant Lake Water, TID ditch water, and water stored in non-point source marshes. Phosphorus concentrations expected from the wetlands are shown in Table 4.

IMPLEMENTATION STRATEGY-PHASED IMPLEMENTATION

The most important element of the first phase will involve both source control and treatment of phosphorus to meet the instream levels of phosphorus specified by DEQ. The first step will be to continue the phosphorus reduction into the collection system by using non-phosphorus and low phosphorus detergents. Efforts to-date have significantly reduced influent phosphorus levels. Continued effort to encourage domestic, commercial, and institutional replacements will significantly reduce levels of phosphorus with the potential of significant savings of capital and 0&M costs. It is estimated that the phosphorus source control can reduce influent levels of phosphorus to 3-4 mg/l. This residual phosphorus will be due to non-phosphorus soaps, cleaning solutions, and detergents not targeted in the source control program. The existing extended aeration treatment removes approximately 2 mg/l of phosphorus in the form of combined phosphorus forms in the cellular mass of the waste activated sludge. A source control target of 3 to 4 mg/l influent of total phosphorus has been used in this analysis. A more aggressive campaign could potentially reduce this level another fifty percent.

The proposal upgrade of the extended aeration component of the WWTP will not significantly change the removal of phosphorus through the activated sludge portion of the treatment plant. We have assumed that the existing 2 mg/l removal of phosphorus or 32 lbs/day will apply in the upgraded treatment plant. We are assuming no chemical addition in this analysis.

The next component of the first phase will be the construction of 25 acres of constructed free surface wetlands. These wetlands will play an important role in removing soluble reactive phosphorus during the late spring and summer. Aquatic macrophytes (cattails and hardstem bulrushes) and associated peri-phytic algae and decomposers will take up phosphorus during the growing season. The plant uptake removes approximately 1.5 to 2 mg/l in 10-12 days retention time during this active growing season. This amounts to 20 to 25 lbs/day or approximately 1 lb/acre/day. Most of this phosphorus taken up during the growing season is released as the plants die-back in the fall and winter. Active decomposition of this detrital material releases the bound organic phosphorus as soluble organic phosphorus and as soluble reactive phosphorus. During the period from April to August (on a normal climatological cycle) the wetland effluent will range from 0.1 to 0.5 mg/l under conservative conditions. This component will give a 8.5 days retention time for a wetland with an average depth of 2 feet at a 1.9 mgd flow. A free board of 2 feet on top at the operating depth of 2 feet will allow for approximately 2 weeks of storage without any discharge to Bear Creek if needed to handle those periods at beginning and the end of the irrigation season. If irrigation opportunities were available in the near vicinity of the wetland then a greater storage volume for that period at the end of the irrigation season would be realized. For example, if the wetland could be drawn down to a minimum depth of 1 foot prior to the end of the season approximately 16 days of storage would be available. Minor plant upgrade and the construction of the wetlands would represent the first components of Phase 1. Extensive monitoring would then determine the impact of these steps in improving fish habitat in Upper Bear Creek.

The next component of the first phase would be to isolate and control all illegal non-point source contributions to the contributing urban drainage into Bear Creek. Several illegal discharges of wastewater have already been identified and redirected to the collection system. An opportunity exists upstream from the WWTP to construct several NPS pond/wetland systems to trap and immobilize phosphorus from animal, agricultural, and horticultural sources of nitrogen and phosphorus. The advantage of this watershed approach is that it allows for an incremental investment of phosphorus to weight against an incremental benefit to fisheries in Bear Creek, while allowing the flow in Bear Creek to be sufficient to support fisheries.

Another component of the first phase would take the effluent from the wetland and process through a rapid infiltration system which had a mixture of locally available sand and clays to further reduce the phosphorus levels into Bear Creek. Studies performed on this project showed that soils found in Ashland area have a high phosphorus adsorption capability. A 30,000 $ft.^2$ rapid infiltration site would be capable of reducing incoming levels of phosphorus at 1-2 mg/l to 0.05 to 0.10 mg/l. This system would have sufficient capacity to remove phosphorus at this level for 5-7 years if only summer wastewater flows were processed.

It is highly probable based upon DEQ analysis that the point source reduction to a 0.08 mg/l in the WWTP effluent will not significantly reduce the algal growth potential in Bear Creek. The NPS levels are sufficiently high to support population of peri-phyton which are adversely affecting water quality. This phase approach will reduce both point and non-point source levels of phosphorus in a parallel manner. The monitoring program will track the impact this reduced BOD, nitrogen, phosphorus, thermal, and toxicity load will have on Upper Bear Creek.

RECOMMENDED MONITORING PROGRAM

An integral part of the phased approach to managing water quality in the Upper Bear Creek watershed is an extensive monitoring program to determine antecedent effects of the various management strategies proposed in Phase 1. The objective of the monitoring program is to develop a pre and post set of conditions in which to evaluate the Phase 1 strategy. The monitoring program should be developed in conjunction with representatives from DEQ and OGF. The monitoring program should be initiated as soon as possible to incorporate this years summer conditions in the pre-project conditions. The final monitoring program should be approved by those agencies involved in decisions concerning water quality, fish habitat, and water resource allocation in the Upper Bear Creek watershed. A suggested monitoring program is shown in Table 4.

The first step in the monitoring program is to establish flow measuring stations that make sense to the Ashland issue. One problem with the existing DEQ sampling is that the sampling/monitoring points do not allow a tracking of the point and non-point sources in the Upper Bear Creek watershed. A sampling/monitoring point should be established directly upstream from the TID takeout at Oak Street. A gaging station needs to be established at this point to allow for an accurate mass balance to be developed. Another sampling monitoring point needs to be established at Valley View Road to allow for an accurate measurement of the mixture of Bear Creek and the WWTP;s effluent. All of the proposed components of Phase 1 can be evaluated with the addition of those two gaging stations. Other upstream and downstream stations need to be established for water quality and quantity measurements.

PHOSPHORUS REMOVAL IN FIRST PHASE WETLAND

A conservative estimate of the standing crop of emergent vegetation would range from 11,000 to 15,000 kg/ha dry weight with approximately 50% coverage. Using a macrophyte phosphorus concentration of 0.15% the annual phosphorus uptake would be approximately 22 kilograms per hectare. Approximately 50% of this phosphorus will be released to the water column upon fall die-off of the plants. Approximately 50% of the standing crop is in the water column the other 50% is below the sediment vegetative material.

In Arcata phosphorus was reduced approximately 1.75 mg/l over the growing season. This resulted in 1.2 lbs/acre/day removal of phosphorus. For a design flow of 1.9 mgd and a 2 mg/l of phosphorus level entering the marsh approximately 33.36 lb/day would be entering this system. For this loading approximately 26 acres of wetland would be required to reduce the levels by 90 to 95%.

TEMPERATURE BENEFITS FROM FIRST PHASE WETLAND

A wetlands ability to function as a temperature moderator is based upon the degree of vegetation cover and the ambient air temperature. The leaves of the macrophytes reflect and adsorb incoming sunlight radiation. Evaporation cools the water column. In the case of Arcata, marine temperate and 40^{o} north, this results in a 4^{o} to 5^{o}C reduction during the warmer summer months. In warmer temperature, such as Gustine in the Central Valley of California (a 7^{o} to 8^{o}C cooler wetland effluent has been documented with ambient summer air temperatures of 30^{o} to 35^{o}F. In the case of Arcata the wetland effluent maximum temperature is 15^{o}C while the open water summer maximum is 19^{o}C. This is sufficiently cooler to allow for salmon and steelhead aqua culture activities to occur without temperature stress to the fish.

Influent temperature to a wetland from a WWTP is dependent upon the temperature of indoor plumbing wastewater, the amount of infiltration and inflow, and the detention time in the treatment/reclamation plant. The longer the retention time and the greater the percentage of vegetative cover the closer the summer maximum comes to the shallow soil temperature. The reverse is true in the winter where the wetland levels temperature tend to lag the cooler winter ambient temperature. Again insulation is provided by the ditrital vegetative material and the specific heat of the water.

A 25 acre wetland would afford approximately 8.5 days of retention. This retention time would be sufficient to significantly reduce effluent temperatures. Based upon summer average ambient air temperature in Ashland of 85^{o}F (30^{o}C) the wetland effluent temperature of approximately 16^{o}C.

Table 4. Proposed Monitoring Program for Bear Creek During Phase 1

	Frequency	Method
Flow Weekly	Gaged	Continuous
Velocity	Weekly	Field
Temperature	Weekly/Instant	Field
Dissolved Oxygen	Weekly/Instant	Field
pH	Weekly	Field
BOD	Weekly/Grab	Laboratory
Ammonia Nitrogen	Weekly/Grab	Laboratory
Nitrate Nitrogen	Weekly/Grab	Laboratory
Nitrite Nitrogen	Weekly/Grab	Laboratory
Total Phosphorus	Weekly/Grab	Laboratory
Soluble Reactive Phosphorus	Weekly/Grab	Laboratory
Suspended Solids	Weekly/Grab	Laboratory
Chlorine Residual	Weekly/Grab	Laboratory
Conductance	Weekly/Instant	Field
Periphyton	Monthly	Field
Chlorophyll	Monthly/Grab	Laboratory
Fish Population	Seasonal	Field

BEAR CREEK WATER QUALITY

Bear creek water quality after implementing management strategies is shown in Table 5. Table 6 shows phosphorus concentrations in Bear Creek at different WWTP inputs and Bear Creek flows.

DESCRIPTION OF MULTIPLE BENEFITS

One method of comparing project alternatives is through the use of Benefit-Cost ratios. For each alternative all costs and all benefits should be included. A previous section addressed capital costs associated with the constructed wetland alternative design described above,. This section will identify benefits which will be realized by implementation of this constructed wetland design and should be included in any economic comparison. Figure 1 shows the relationship between the system components and benefits derived from the wetland system.

As a economic analysis tool, an exhaustive benefit chart for constructed wetlands has been compiled at Humboldt State University. These benefits are organized in a way that allows dollar values to be attributed to each benefit and then summed, although this is a complex activity which will be left to others. The benefit chart is useful, however, to envision system benefits from a constructed wetland.

TABLE 5 BEAR CREEK WATER QUALITY AFTER IMPLEMENTING MANAGEMENT STRATEGIES, in PPM

TECHNOLOGY	10 CFS BEAR CREEK FLOW, WARM WEATHER				10 CFS BEAR CREEK FLOW, COLD WEATHER				20 CFS BEAR CREEK FLOW, WARM WEATHER				20 CFS BEAR CREEK FLOW, COLD WEATHER			
	BOD	SS	NH3	P*	BOD	SS	NH3	P*	BOD	SS	NH3	P*	BOD	SS	NH3	P*
PRESENT	4.0	4.0	5.1	1.1	4.0	4.0	4.4	1.1	2.9	2.9	3.0	1.0	2.9	2.9	2.6	0.63
WETLAND B1, MAJOR PLANT IMPROVEMENTS	2.3	2.3	2.9	0.13	2.3	2.3	0.46	0.75	2.0	2.0	0.3	0.10	2.0	2.0	0.39	.46
WETLAND B2, MINOR PLANT IMPROVEMENTS	2.3	2.3	1.6	0.13	2.3	2.3	3.7	0.75	2.0	2.0	0.91	0.10	2.0	2.0	2.2	0.46
WETLAND B3, INCLUDES USE OF STORAGE	1.8	1.8	0.29	0.08	2.0	2.0	0.46	0.75	1.7	1.7	0.29	0.08	1.8	1.8	0.39	0.74
WETLAND B1 WITH NPS MARSH,	1.9	1.9	0.21	0.10	1.9	1.9	0.38	0.73	1.5	1.5	0.21	0.10	1.5	1.5	0.3	0.43
WETLAND B2 WITH NPS MARSH,	1.9	1.9	1.5	0.11	1.9	1.9	3.6	0.73	1.5	1.5	0.95	0.08	1.5	1.5	2.1	0.43
WETLAND B-3 WITH NPS MARSH	1.5	1.5	0.21	0.06	1.7	1.7	0.38	0.73	1.3	1.3	2.0	0.05	1.4	1.4	0.30	0.43

a. Phosphorus levels assume source control is implemented
b. Alternative B1 includes full nitrification upgrade of existing WWTP.
c. Alternative B2 includes limited work on aeration/nitrification in existing WWTP.
d. Alternative B3 includes use of volume storage/timed release to meet phosphorus standard.
e. Bear Creek background (without use of NPS marsh) assumed to be: BOD level of 1.5 PPM; SS level of 1.5 PPM; ammonia level of 0.3 PPM; phosphorus level of 0.08 PPM.
f. WWTP plant flow assumed to be 1.95 MGD , or 3.0 CFS

Combined PO4 loads

WWTP PO4	comb @5cfs	comb @10cfs	comb @20cfs	comb @30cfs	comb @40cfs	comb @50cfs	comb @60cfs	comb @70cfs	comb @80cfs
		note this assumes a background level of .07 po4 in the creek							
0.10	0.08	0.08	0.07	0.07	0.07	0.07	0.07	0.07	0.07
0.20	0.12	0.10	0.09	0.08	0.08	0.08	0.08	0.08	0.07
0.30	0.15	0.12	0.10	0.09	0.09	0.08	0.08	0.08	0.08
0.40	0.19	0.14	0.11	0.10	0.09	0.09	0.08	0.08	0.08
0.60	0.26	0.19	0.14	0.12	0.10	0.10	0.09	0.09	0.09
0.80	0.33	0.23	0.16	0.13	0.12	0.11	0.10	0.10	0.09
1.00	0.40	0.27	0.18	0.15	0.13	0.12	0.11	0.11	0.10
2.00	0.76	0.49	0.31	0.23	0.20	0.17	0.16	0.14	0.14
3.00	1.12	0.71	0.43	0.32	0.26	0.23	0.20	0.18	0.17
4.00	1.48	0.93	0.55	0.41	0.33	0.28	0.25	0.22	0.20
5.00	1.84	1.15	0.68	0.49	0.39	0.33	0.29	0.26	0.24
6.00	2.20	1.37	0.80	0.58	0.46	0.38	0.33	0.30	0.27

note: this assumes a background level of .04 mg/l PO4									
WWTP PO4	comb @5cfs	comb @10cfs	comb @20cfs	comb @30cfs	comb @40cfs	comb @50cfs	comb @60cfs	comb @70cfs	comb @80cfs
0.10	0.06	0.05	0.05	0.05	0.04	0.04	0.04	0.04	0.04
0.20	0.10	0.08	0.06	0.05	0.05	0.05	0.05	0.05	0.05
0.30	0.13	0.10	0.07	0.06	0.06	0.05	0.05	0.05	0.05
0.40	0.17	0.12	0.08	0.07	0.06	0.06	0.06	0.05	0.05
0.60	0.24	0.16	0.11	0.09	0.08	0.07	0.06	0.06	0.06
0.80	0.31	0.21	0.13	0.10	0.09	0.08	0.07	0.07	0.07
1.00	0.38	0.25	0.16	0.12	0.10	0.09	0.08	0.08	0.07
2.00	0.74	0.47	0.28	0.21	0.17	0.14	0.13	0.12	0.11
3.00	1.10	0.69	0.40	0.29	0.23	0.20	0.17	0.15	0.14
4.00	1.46	0.91	0.53	0.38	0.30	0.25	0.22	0.19	0.17
5.00	1.82	1.13	0.65	0.46	0.36	0.30	0.26	0.23	0.21
6.00	2.18	1.34	0.77	0.55	0.43	0.36	0.31	0.27	0.24

TABLE 6. Phosphorus Concentrations in Bear Creek

riparian and adjacent upland areas suitable for multiple benefits. This is the most aggressive of the Alternatives presented in terms of providing multiple benefits, and it requires the most acreage. Wetland Alternative B3 may represent a final build out possibility for a phased approach. This alternative is set on two sites described in Appendix A as Butler Marsh East and Butler Marsh West, and on parts of sites designated Billing's Marsh and Wright's Creek. This alternativewould commpliment the possible development as a golf course of the remainder of the latter two sites. Three acres of land to the west of the WWTP will also be utilized for a pre-disinfection marsh unit to reduce solids; this area is called Pearl Marsh.

The over riding theme of this design is to maximize the possibility of incorporating multiple benefits, to provide the widest possible management choices for treating, exchanging, and re-using treated effluent, and to insure that DEQ regulations are meet at all times. A description of this design incorporating 90 acres is given below, and is shown in Figure 2.

Effluent from the WWTP flows into Pearl Marsh where BOD and SS are reduced prior to disinfection. The UV unit is located near the west boundary of the esisting WWTP. This first marsh in this system will have a solid bulrush based biotic community,to insure treatment goals. It will be fenced and will be off limit to the public. Trails and recreation along this marsh will be greatly

Table 2.3 **Allowable Effluent Concentrations Based on Bear Creek Flow 10 CFS, WWTP Flows of 2.0 MGD Summer and 2.4 MGD Winter**

Parameter	Seasonal Applicability	In-Stream Limit	Allowable Effluent Value (m)
CBOD, mg/l	Summer Winter	<3.0 <2.5 (h)	5.1 (a,c,f,v,s) < 11 (b,d,f,q)
CBOD + NBOD, mg/l	Summer Winter	3.0 2.5 (h)	- (a,c,f) 11 (b,d,f,g,p,t)
Ammonia-N, mg/l	Summer Winter	0.25 1.0	2.7 (a,c,f,u,v) 6.2 (b,d,f)
Chlorine - mg/l	Summer Winter	0.011 0.011	0.025 (a,c,f) 0.021 (b,d,f)
Total Phosphorus, mg/l	Summer	0.08	0.08 (e)
Temperature, °F	Summer Winter	58 58	75.6 (a,c,i,k) 38.8 (b,d,j,l)

(a)	Assumed summer stream flow, cfs	10
(b)	Assumed winter stream flow, cfs	<70
(c)	Assumed summer plant flow, mgd	2.0
(d)	Assumed winter plant flow, mgd	2.4
(e)	Assumes background concentration equal to or higher than in-stream limit	
(f)	Assumes zero background concentration	
(g)	Current CBOD+NBOD winter discharge, ppd	1552
(h)	Measured at Kirtland Road in Medford	
(i)	Assumed summer stream temperature, °F	75
(j)	Assumed winter stream temperature, °F	35
(k)	Allowable summer temperature increase, °F	0.25
(l)	Allowable winter temperature increase, °F	2
(m)	Assumes discharge to Bear Creek	
(n)	Average values for January 1991 through April 1992	
(o)	Expected average values	
(p)	Limit based on the lesser of current mass discharges of CBOD+NBOD from WWTP divided by future plant flow, and allowable CBOD + allowable (NH_3 times 4.35)	
(q)	Limit based on the lesser of 30 mg/l or the allowable CBOD+NBOD	
(r)	CBOD mass limit (streamflow<10 cfs), ppd	59
(s)	Limit based on the lesser of allowable CBOD+NBOD or CBOD mass discharge limit	
(t)	CBOD+NBOD mass limit (streamflow<70 cfs), ppd	220
(u)	NH_3 mass limit (streamflow<10 cfs), ppd	11
(v)	Limit based on lesser of instream limit and mass limit	

2.5.3 DEQ CRITERIA AT 2 MGD AND 10 CFS BEAR CREEK FLOW

Criteria for treatment plant effluent have also been calculated taking into account a revised treatment plant flow estimate of 1.9 mgd and Bear Creek flow of no less than 10 cfs. The revised treatment plant flow estimate is due to implementation of Ashland's water conservation program which is described in detail elsewhere in this paper.

An assumption of flow in Bear Creek of no less than 10 cfs also seems justified. First, at a Rogue Valley Council of Governments meeting on June 1, 1993, it was stated by State of Oregon Agencies (ODFW, WRD, DEQ) that this flow was the target for minimum flow in this creek. It is also apparent that this is one of the goals of the City of Ashland and the Ashland Wetlands Coalition. It seems very probable that this flow can be accomplished by use of purchased and already controlled water rights.

WETLAND BENEFITS

WORKSHEET

General Class of Benefit	User (U); Localized Non-user (L); Global Non-User (G)	Parent Resource or Process	Benefit Resource Present	Specific Human Use Benefit	ID. No
Recreation	U	Production, Habitat	Fish and Shellfish	Local Fishing	1
Recreation	L	Biomass Production, Habitat	Food Source & Juvenile Habitat	Downstream Fishing	2
Recreation	U	Production, Habitat	Birds	Recreational Hunting	3
Recreation	U	Production, Habitat	Mammals	Recreational Hunting	4
Recreation	U	Production, Habitat	Birds	Bird Watching	5
Recreation	U	Production, Habitat	Park Setting	Scenic Enjoyment	6
	U	Production, Habitat	Park Setting	Hike, Walk, jog	7
Recreation	U	Production, Habitat	Park Setting	Picnic	8
Recreation	U	Prod., Atmospheric Cycles	Park Setting, Open Water.	Non-fish Boating	9
Recreation	L	Production, Location	Bird Migration Stop	Non-local Bird Hunting	10
Recreation	L	Production, Location	Bird Migration Stop	Non-Local Bird Watching	11
Recreation	U/L	Atmospheric Cycles	Microclimate Regulation	Comfort, Relief, Health	12
Health	U,L	Location	Relaxing Vistas	Comfort, Relief, Health	13
Health	U	Location	Quietness	Comfort, Relief, Refuge	14
Health	L	Water Purification	Several Processes	Water Treatment (Point Source)	15
Health, economic Health (global)	G	Atmospheric Cycles, Production	Atmospheric Maintenance	Comfort, Relief Health (global)	16
Health (global)	G	Water Purification	Several Processes	Ocean Quality (Non-Point S. Treatment)	17
Health	L	Emergency Water Trtmt. & Storage	Less Loss to Local Economy & Environ.	Redundancy (back-up system)	18
Health	L	Aquifer Recharge	Water	Drinking Water Recharge	19
Health	L	Natural Feedback	Contained location	Indicator of ecological disorder	20
Commercial	L	Location	Local, Out of Town Wetland Users	Increase in Local Business	21
Commercial	L	Biomass Prod. Habitat	Food Source & Juvenile Habitat	Downstream Fishing Protection	22
Commercial, Forage	L	Productivity	Fish, Mammals, Berries, etc.	Food & Fiber Source (for human use)	23
Commercial	L	Aquifer Recharge	Water	Ag. Water Supply Recharge	24
Property Value	L	Volume Storage	Flood Desync.	Less Flood Damage	25
Property Value	L	Mitigation	Allow Development	Development	26
Property Value	L	Land Form, Water	Water Storage	Fire Water Supply	27
Property Value	L	Riparian Forms, Vegetation	Wave, Erosion Control	Less Erosion	28
Property Value	L	Location	Proximity of Benefits	Higher $/acre for Adjoining Property	29
Time/Energy	L	Upstream Vol. Storage	Flood Desyn-cronization	Less Road Closure Due to Flood	30
Energy	L	Peat or Biomass Production	Peat or Biomass	Energy Fuel	31
Education,	U,L,G	Natural Processes	Natural Lab	Direct Study	32
Scientific	G	Natural Processes	Natural Lab	Educational Books, Films	33
Education, Recreation	U,L	Natural Processes, including Production	Natural Setting	Televised, filmed Fishing, Hunting	34
Heritage, Religious	U,L	Mystery	Remembered or Sacred Places	Spiritual Benefits	35
Heritage	U,L,G	Archaeology	Ruins, Remains	Direct Study	36
Conservation	L	Biodiversity	Species Diversity	Endangered Species Protection	37
Conservation	G	Ecological Web	Natural Web	Biological Maintenance	38
Conservation	L	Conservation	Diverse and Balanced Biosystem	Vicarious Consumption, Peace of Mind	39
Aesthetics	U,L	Mother Nature	Beauty	Aesthetic Uses	40
Unknown	U,G,L	Unknown	Unknown	Undiscovered	41

PRELIMINARY SITE SURVEY MATRIX, CONSTRUCTED WETLANDS FEASIBILITY STUDY, ASHLAND, 1993

SITE	SOIL, SLOPE	ELEVATION *	TOTAL AREA	AREA USABLE FOR MARSH	CURRENT LAND USE	TID OR WATER RIGHTS	POINT SOURCE OR NPS SUITABILITY	COMMENTS
#1 HAMBY SPRINGS	27B, 1-5%	1780 FEET TO 1860 FEET	75	60	PASTURE	50 ACRES	POINT SOURCE	
#2 EAGLE MILL ROAD	27B, 1-5%	1750 FEET TO 1780 FEET	20	12	PASTURE		POINT SOURCE	
#3 BUTLER CREEK WEST	27B, 1-5%	1725 FEET TO 1850 FEET	35	23	PASTURE		POINT SOURCE	
#4 BUTLER CREEK EAST	27B, 1-5%	1720 FEET TO 1740 FEET	35	21	PASTURE		POINT SOURCE	
#5 CURL UP CREEK	27B, 1-5%	1710 FEET TO 1820 FEET	40	20			POINT SOURCE	
#6 WRIGHT'S CREEK	31A, 0-5%	1660 FEET TO 1705 FEET	30	24	IRRIGATED AGRICULTURE		POINT SOURCE OR NON-POINT SOURCE	
#7 BILLINGS MARSH	31A, 0-3%	1680 FEET TO 1705 FEET		10	PASTURE		POINT SOURCE OR NON-POINT SOURCE	
#8 NEVADA MARSH	27B, 1-5%	1780 FEET TO 1860 FEET	44	15	AGRICULTURE		POINT SOURCE OR NON-POINT SOURCE	
		* ELEVATION AT WWTP OUTFLOW IS 1719 FEET						

CONTINUATION OF
PRELIMINARY SITE SURVEY MATRIX, CONSTRUCTED WETLANDS FEASIBILITY STUDY, ASHLAND, 1993

SITE	SOIL, SLOPE	ELEVATION *	TOTAL AREA	AREA USABLE FOR MARSH	CURRENT LAND USE	TID OR WATER RIGHTS	POINT SOURCE OR NPS SUITABILITY	COMMENTS
# 9 MEYER MARSH	27B, 127A, 139A. 0-4%	1600 FEET TO 1700 FEET	100	60	3 RESIDENCES, GRAZING		POINT SOURCE OR NPS SUITABILITY	
# 10 TAKELMA MARSH	2A, 0-3 %	1810 FEET TO 1840 FEET	60	35	PASTURE		POINT SOURCE OR NPS SUITABILITY	
# 11								
# 12								
# 13								
# 14								
# 15								
# 16								
	* ELEVATION AT WWTP OUTFLOW IS 1719 FEET							

The following is an abstract of a paper given at the 66th Annual Conference of the Water Environment Federation, October 3-7, 1993, Anaheim, California.

Title of Session: NATURAL SYSTEMS

Title of Paper: Phosphorus Removal in Wetlands

Authors: Gearheart

Affiliations:

Date of Session: **Session No.:**

ABSTRACT

The objective of this research was to determine the nutrient budget for the city of Arcata's free surface constructed wetland and to determine the phosphorus uptake, storage, and release relationships for a wetland receiving oxidation pond effluent. Samples were taken weekly during the pilot study period (1985-86) and the full scale study (1986-present) and analyzed for phosphorus., nitrogen forms, BOD, SS, and physical factors. Trends in phosphorus uptake and release were determined and statistically analyzed. Phosphorus loading and uptake rates were determined for these wetlands

The biomass accumulation of phosphorus was determined to be 80 kg in the 15 hectare wetland. A variety of emergent and submergent plants exists in the wetland. The predominate macrophyte communites made up of bulrushs, cattails, pond weed, and duck weed. Approximately 1 to 1.5 mg/l of orthophosphate was removed at a loading of 1.6 kg/ha /day during the growing season. Approximately 80 % of this phosphorus was released in the 3 month period in the fall. This 0.2 kg/ha/day phosphorus retention is considered to be permanently tied up in the peat development in the marsh.

This study has determined the seasonal uptake rate of phosphorus in a constructed wetland receiving treated domestic effluent and has determined the timing of the uptake and release for a marine temperate climate. Management alternatives have been suggested that would take advantage of these relationship. If effluents from a treatment plant were in the the range of 1-2 mg/l it is possible that constructed free surface wetlands could be used to remove phosphorus in the growing season that would meet the phosphorus limiting concentrations in receiving streams or estuaries.

into the system from an adjacent freshwater slough. Monthly average BOD, suspended solids, and total inorganic nitrogen levels are 5, 5, and 5 mg/l respectively. Ninety percent of the weekly values of BOD and SS have been less than 15 mg/l in wetland effluent for the last 6 years. Samples were taken during the pilot study phase and during the fullscale operation phase to determine the budget and removal efficiencies. This study also determined the relationship between phosphorus loading on a short term and long term basis and characterize effluent phosphorus levels. From 1980 through 1985 12 6 by 66 m pilot wetlands were operated and tested for a wide range of pollutant removal effectiveness and wetland management alternatives. Information gathered from the pilot project was used to design the full scale project (Gearheart, 1988).

The phosphorus in the biomass estimated for this study was 80 kg for the 15 Ha wetland. The monthly wastewater phosphorus exposure was determined to be 500-700 gm. The phosphorus contained in the predominant macrophytes *Typha latifolia* and *Scripus acutus* was determined to be 2.1 to 2.9 g P/kg dry weight of biomass respectively. *Lemna spp.* was determined to be 9.0 g P/kg dry weight. Emergent macrophytes were the predominant plant type in the constructed wetland making up 90 to 98% of the total standing crop.

The influent orthophosphate level from the oxidation varied considerably over the study period. The influent had a range of 2.5 with a mean of 3.22 mg/l and a standard deviation of 0.69 mg/l. The wetland effluent had a range of 0.7, a mean of 2.7 mg/l and a standard deviation of 0.47 mg/l. Mass balances of dissolved orthophosphates showed influent levels ranging from 27 to 47 g P/day leaving the system. Removal rates of orthophosphates varied from 36% in February to 40% in April. During the fall months of November and December effluent was higher than the influent 5.6 and 6.3 mg/l compared with 3.3 and 4.1 mg/l.

Three forms of phosphate were measured at the beginning of the project, filtered orthophosphate, unfiltered orthophosphate, and total phosphate. Since orthophosphate accounted for 95-100% of the total phosphate and is soluble, measurements of total phosphate and filtered orthophosphate were discontinued after initial analysis. The unfiltered total phosphorus was 5 to 20% greater than the filtered orthophosphate.

Oxidation Pond Effluent

The orthophosphate in the oxidation pond effluent ranged from 4.0 mg/l to 13.0 mg/l as P on a weekly basis. The oxidation pond effluent phosphorus levels were the same as the influent to lthe oxidation pond. There was no removal of phosphorus in the oxidation ponds on an annual average basis. The marsh cell effluent orthophosphate levels demonstrated a direct correlation with the influent levels. The phosphate levels in the oxidation pond averaged 7.1 mg/l as P the first year and 5.5 mg/l as P the second year. The marsh cells effluent essentially averaged the same as the influent the first year with reduction of 10-20% occurring in the lower loaded cells the second year of the study. Ninely nine percent of all the phospholrus levels from the oxidation ponds were below 10 mg/l. The cyclic nature of the phosphorus coming out of the ponds are due to dilution by I/L in the winter and phytoplankton blooms in the growing season. Statistically significant relationships between the influent and effluent levels still existed during the second year of the study.

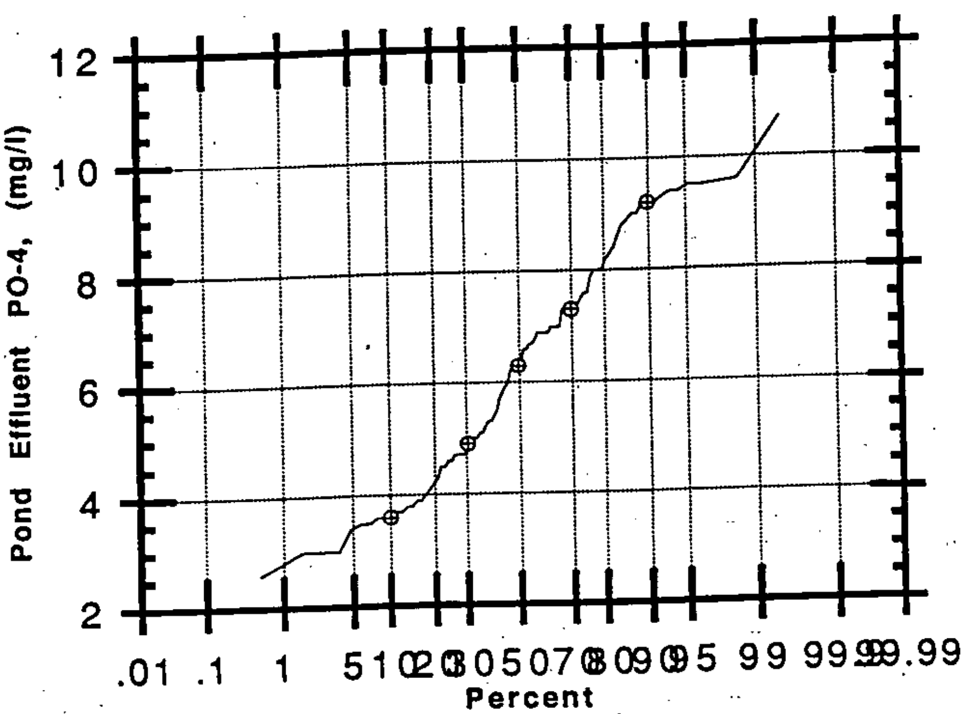
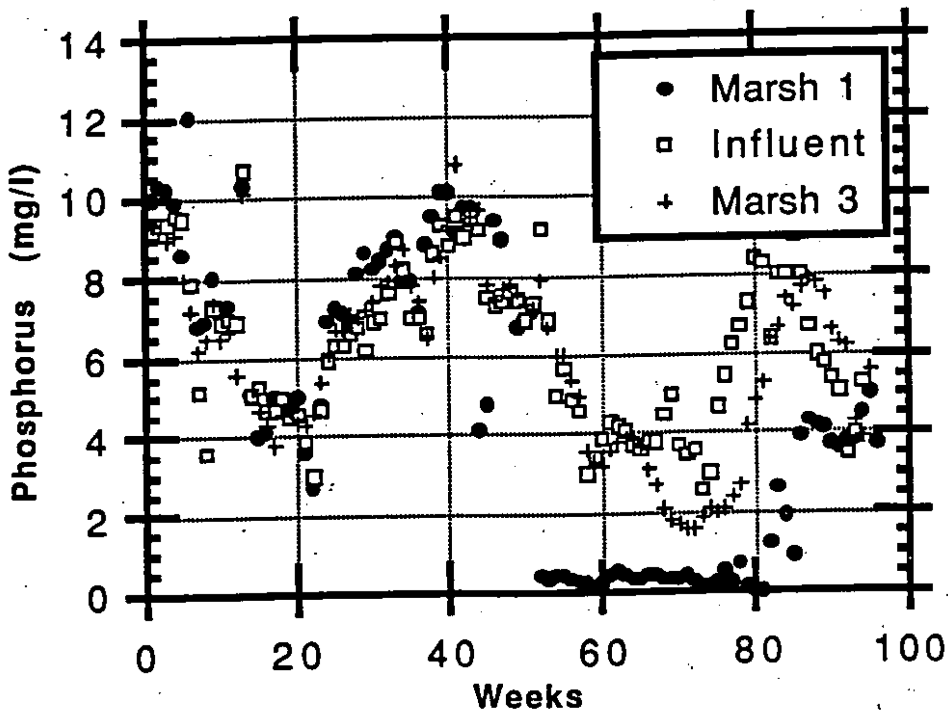


Figure 1. Orthophosphate as phosphorus concentrations in Arcata's oxidation pond effluent

Marsh Cell Effluent

With the range of phosphate loadings used in the pilot study, both removal and release of phosphate was noted. The only exception was in the last quarter of the project, in those cells receiving the lowest hydraulic loading. Figure 2 show a comparison of unfiltered orthophosphate in cells 3 and 5. There is five-fold difference in flows to these cells, 0.02 m^3/m^2/day (0.5 gal/ft^2/day) and 0.11 m^3/m^2/day (2.7 gal/ft^2/day), respectively. Figure 2 shows the pilot cell effluent phosphorus concentrations at two different loading rates. Cell 3 was loaded low enough to show a reduction in the water column concentration compared to Cell 5. This effect was only observed, though, in the growing season. Cell 3 was loaded at 1.6 kg/ha/day and cell 5 was loaded at 8.6 kg/ha/day.



Figures 2 - Influent and Marsh 1 & 3 Orthophosphate Values for the 100 Wk Study Period (Marsh 1 was loaded at 1 liter per second for 50 weeks Oxidation Pond Effluent and 50 weeks with tap water. Marsh 3 was loaded at 0.13 liters per second for the second 50 weeks.

Figure 2 shows the effect of phosphorus loading on effluent quality. At 1.61 Kg/ha/yr Marsh 3 produces an effluent, during the growing season, of approximately 2 mg/l less than the influent. Marsh cell 1 was loaded heavily for one year then fed tap water. Marsh 3 was vegetated primarily with hardstem bulrush and had not been harvested or altered in the 5 years of operation. The orthophosphate level dropped to less than 2 mg/l during the growing season but released phosphorus (plant and microbial decomposition) at levels as high as 4 mg/l during the non-growing season. During the period from April through August the wetland was removing about 1- to 1.5 mg/l. The oxidation pond phosphate level were also cycled with the phytoplankton and zooplankton activity in the oxidation ponds. Over this same period the oxidation pond effluent was varying from 4 to 8 mg/l.

For the most part, the marsh systems did not appear to be phosphorus limiting at the phosphorus loadings in this study. In fact, the macrophytes and microorganisms appeared to be able to acquire their phosphorus from the sediments and/or from the phosphorus bound to the settled non-filterable residue. Some indication of phosphorus removal was apparent in the lower loaded cells (0.123 1/sec; 2 gpm) during the spring and summer of 1982. As can be seen in Figure 5, when the growing season began in 1982, the orthophosphate in the effluent of cell 5 remained the same as the influent through the growing season. In cell 3 however, there was a significant removal of phosphates through the growing season, with a removal rate between 40 and 60 percent. Apparently at a phosphate loading rate of 9.6 kg/ha/day (8.5 lb/acre/day), phosphorus removal can occur. Obviously, these depend upon initial phosphorus in the soil and the type and density of macrophyte community and microbial population. THe release of bound phospholrus can be seen in Figure 2 where the experimental conditions were changed going from a high loading of 9.6 kg/ha/day to adding only tap water at the same hydraulic rate for the next year, Cell 1. In this cell the phosphorus concentration in the Fall was between 4 and 5 mg/l for several months as the phosphorus was released from the micro and macro communities.

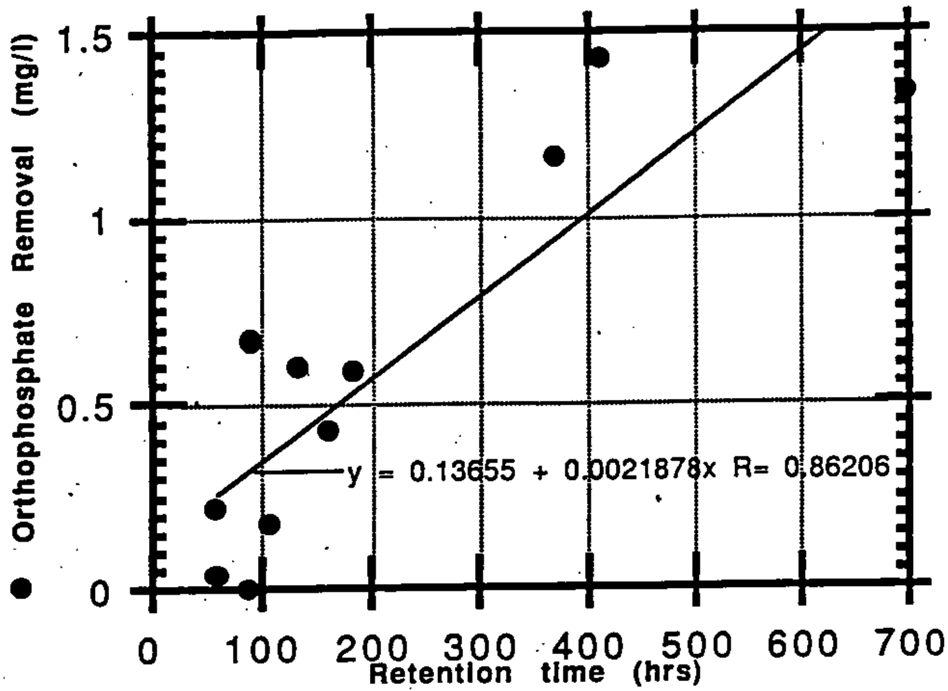


Figure 4 Retention Time vs Orthophosphate Removal (mg/l)

Figure 3 shows the effect of retention time on effluent orthophosphate levels. An effluent value of about 4.0 mg/l or about 1.5 mg/l less than the effluent was observed in the growing season. Generally the longer the retention period after 350 hours the less the phosphorus reduction. Figure 4 shows a plot of orthophosphate removal as a function of retention time. Again above 350 hours the removal rate appears to be constant at this level of influent phosphorus.

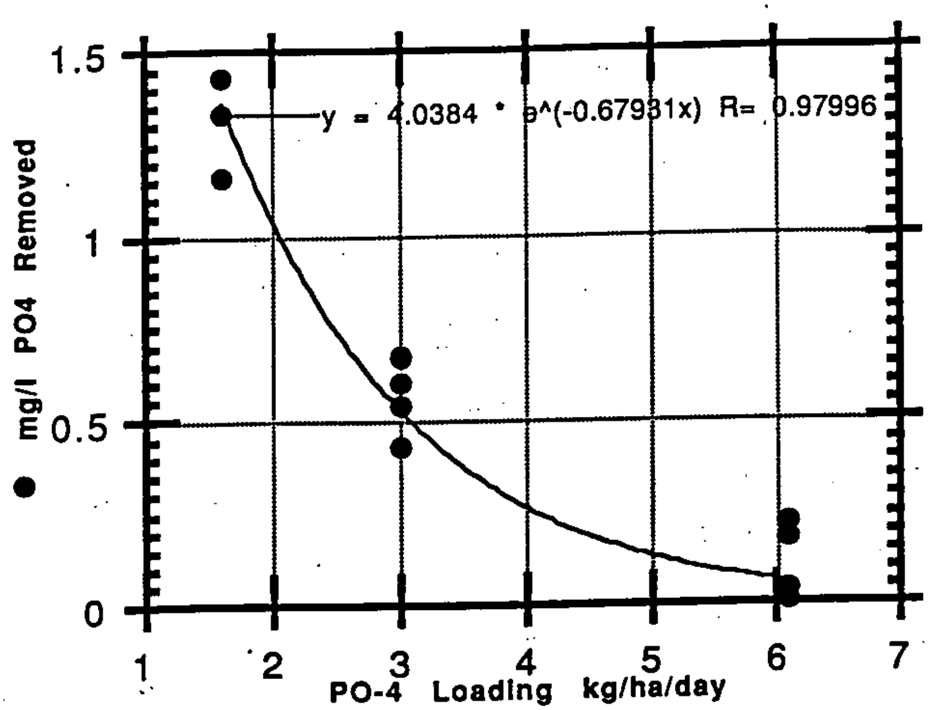


Figure 5 Phosphorus Loading vs. Orthophosphate Removal

Figure 5 shows the orthophosphate removal as a function of phosphorus loading. Phosphorus loadings of 1.0 - 1.5 Kg/ha/day was shown to remove 1.5 mg/l of orthophosphate in a well established constructed wetlands. Figure 5 shows the orthophosphorus uptake during the growing season at loadings of 1.61 Kg/ha/day. The orthophosphorus uptake appeared to remain constant at about 2 mg/l over the 16 week period.

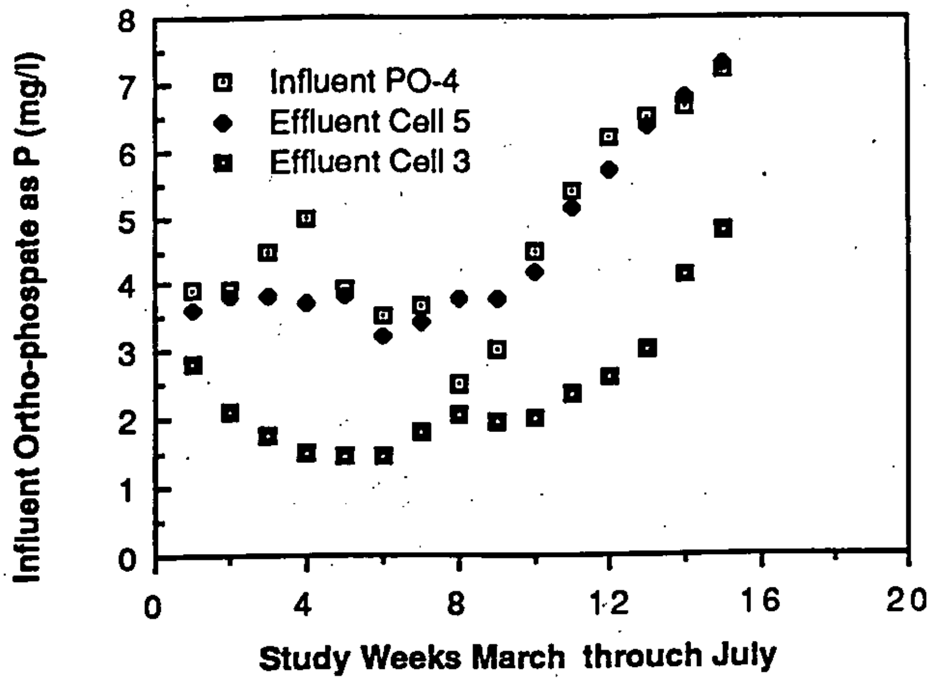


Figure 6 Orthophosphate Concentration During the Growing Season at Loading rates of 1.6 kg/ha/day and 6.4 kg/ha/day.

Summary

- The marsh system appeared not to be phosphorus limited with removal occurring only at the lower hydraulic loaded cells during the growing season. Hydraulic loading rates of 0.02 m^3/m^2/day (0.5 gal/ft/day), with influent unfiltered orthophosphates of 6-7 mg/l as P, appeared to be the threshold for phosphorus removal in a system with limited phosphorus in the soil.

- Arcata's constructed wetlands reduce the concentration of orthophosphate through plant uptake, suspended solids adsorption and settling, and sediment adsorption. These observed reductions appear to change orthophosphate to less available forms of phosphorus.

- A large portion of total phosphate remains in plant tissue even during the period of senescence.

- The wetland serves to stabilize the fluctuating orthophosphate concentrations that enter through the raw wastewater and the oxidation pond effluent.

- There is an increase in effluent orthophosphate concentrations in the late fall and early winter season compared to the spring and summer. Release of phosphorus appears to be related to a combination of factors such as the first frost of the year and fall and winter water temperatures.

- There is a decrease in effluent orthophosphates in the early spring and summer. Approximately 1.5 mg/l of orthophosphate can be removed from the water column at a phosphate loading rate of 0.2 to 0.4 Kg/HA/day.

- Under the above conditions a retention time of approximately 16-20 days for a wetland .5 meter deep would remove approximately 1-2 mg/l on an average annual basis and twice that amount seasonally in maritime temperate climate.

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Study Session

AGENDA FOR A SPECIAL JOINT MEETING BETWEEN ASHLAND CITY COUNCIL AND ASHLAND PLANNING COMMISSION JUNE 29, 1993

I. Improving communications

A. Council - Commission

B. Public Hearings
1. Making public hearings more user friendly
2. Addressing witnesses and developers
3. Layout and lighting of room
4. Explanation of criteria

C. Neighborhood meetings
1. Make part of application process
2. Define requirements/neighborhood

D. Requiring mediation[1]

II. Policy matters

A. Consistent process for both bodies

B. Limiting appeals process
1. Final decision at the planning commission level
2. Making appeals on the record

III. Other Issues of concern to the Council and Commission

A. Jackson County action on exceptions (re-zoning) in interface area

B. Other

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[1] 197.860 Stay of proceedings to allow mediation. All parties to an appeal may at any time prior to a final decision by the Court of Appeals under ORS 197.855 stipulate that the appeal proceeding be stayed for any period of time agreeable to the parties and the board or court to allow the parties to enter mediation. Following mediation, the board or the court may, at the request of the parties, dismiss the appeal or remand the decision to the board or the local government with specific instructions for entry of a final decision on remand. If the parties fail to agree to a stipulation for remand or dismissal through mediation within the time the appeal is stayed, the appeal shall proceed with such reasonable extension of appeal deadlines as the board or Court of Appeals considers appropriate.

Memorandum

December 28, 1994

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: DEQ Meeting, Brown and Caldwell Letter

NOTE

I will not be at the January 3 Council meeting due to personal commitments.

ACTION REQUESTED

DEQ Meeting: Confirm date, set time of meeting. (DEQ has reserved Council Chambers,Thursday, January 12, 1995, 4:00 p.m. to 10:00 p.m.) Pete Belcastro has agreed to at least tape meeting and replay at a later date. (There is the possibility of a live broadcast.)

Brown and Caldwell letter report: If this meets Council request, accept letter report.

BACKGROUND

DEQ Meeting: See attached letter from Jon Gasik. Note: This is a DEQ meeting and not a City Council meeting.

Brown and Caldwell Letter Report: It is interesting to note how large a portion of the costs are associated with phosphorous removal ($13,281,000) and a Level IV effluent ($4,412,000). To meet winter standards, the estimated cost is $15,735,000. The construction cost of $17,693,000 is required to meet phosphorous and Level IV standards!

The costs have been upgraded using the Engineering News Record Construction Cost Index. The figures will be refined over the next few weeks by John Holroyd and will include construction, operation and maintenance, replacement water costs and net present value. In addition, visual aides are being prepared for the public review process.

If the Council wishes, I will invite John Holroyd to discuss his report at your January 17 meeting.

STAFF COMMENTS

As I noted at the last Council meeting, a key decision should be made by the Council. The decision is whether Ashland will continue to consider an option which will allow year around discharge to Bear Creek. I have a concern for year around discharge. The concern is the ability of either a tertiary treatment plant or a combination of wetlands and soil filtration to consistently meet summer standards. Based on my review of the options, I cannot recommend either solution to the Council because neither option has a proven track record.

If Council elects not to pursue a year around discharge option, I believe that there are only three candidates available for serious consideration. I have dropped our "alphabet soup" system for this review. The first two options I consider a "toss up". The third option I have some reservations.

<u>OPTION 1</u> requires a major upgrade to the wastewater treatment plant with winter discharge to Bear Creek and summer discharge to the TID canal near Oak Street. A gallon-for-gallon exchange with TID stored provides a "no loss" condition for Bear Creek. The TID Board of Directors has expressed a concern for their customers with the use of reclaimed water. In that light, a 25 acre wetland and a Level IV effluent probably will be required to satisfy TID and their customers. A minimum addition to the major plant upgrade would be a 25 acre pond to store water during the spring and fall "windows" of time between the summer standards and the TID irrigation season. The TID exchange option meets the Council's written goal of not reducing flows in Bear Creek.

<u>OPTION 2</u> is similar to Option 1 but would have summer discharge applied as spray irrigation to approximately 750 acres of land. The costs assume City purchase of the land. The land could be used in a positive manner by producing a grass crop. A 20 acre storage pond would be required to balance the effluent flow with available irrigation days. If wetlands are deemed a value to the community by the Council the pond could be constructed as wetlands. The initial investigation of property for this option included 1300 acres. Of the 1300 acres, portions of 520 acres have TID stored water rights totalling 708 acre-feet of stored water. These water rights have a priority date of 1915, the same as all other agriculture stored water rights in the Bear Creek basin. The following table gives the volumes available for given durations, assuming different scenarios for percent of water available from storage. I am not aware of the allocation falling below 80% in the past seven years. As a general rule, 2 months supply would fill the low flow gap after TID stopped flowing water in Bear Creek until the first rains of the fall season.

Percent Stored Water Available	100%*	90%*	75%*
Length of Time Water Supplied to Bear Creek	Volume Available in MGD **	Volume Available in MGD **	Volume Available in MGD **
2 Months	3.85	3.46	2.89
3 Months	2.54	2.29	1.90
4 Months	1.92	1.73	1.44
5 Months	1.54	1.39	1.15

* Water available based on % reservoirs are full less a reserve

** Million Gallons per day

OPTION 3 would contemplate the raising of the existing wastewater treatment plant and constructing a pump station and approximately 7 miles of sewer line. Ashland's effluent would be transported by the Bear Creek Valley Sanitary Authority (BCVSA) system to the Medford Wastewater Plant. My main concern with this option is the permanent removal of approximately 2 million gallons of water a day from the upper reaches of Bear Creek and the City of Ashland. Part of my reservations towards this option is the future need for drinking water for the ensuing generations. Technology is available to produce drinking water from the effluent. Cost, public acceptance and other less costly options for drinking water do not make this an attractive alternative at this point in time. The Medford Reclamation Project holds promise for replacement of the treated effluent removed from Bear Creek.

Medford Reclamation Project: The approximate construction cost for the project is $15,000,000 with annual operating costs estimated at $60,000. This does not include costs which either the Medford Irrigation District (MID) or Rogue River Valley Irrigation District (RRVID) may have to invest if their existing canal system is inadequate to transport the reclaimed water.
Howard Prairie has a capacity of 60,000 acre-feet which is split TID (48,000 acre-feet), MID (8,000 acre-feet) and RRVID (4,000 acre-feet). With the Medford Reclamation Project all or a portion of the 12,000 acre-feet assigned to MID and RRVID could be redistributed for instream, agriculture and municipal use. There would be legal hurdles to overcome involving the three irrigation districts, the Oregon Water Resources Department and the U.S. Bureau of Reclamation.

SUMMARY

The decision is not a simple or an easy one for the Council. The impacts are far reaching as they set a commitment for the future of Ashland and Bear Creek while severely restricting Ashland's ability to finance any other projects for the next 20 years.

cc: Jonathan Gasik, P.E., Environmental Engineer, DEQ Medford
John Holroyd, P.E., Brown and Caldwell Consulting Engineers
John Davis, P.E., Woodward-Clyde Consultants
Dennis Barnts, Water Quality Superintendent
Gary Schrodt, Ashland Wetlands Coalition
Nancy Abelle, Ashland Clean Air Coalition

Enc: Gasik letter (12/23/94)
Holroyd letter (12/22/94)

Oregon

DEPARTMENT OF ENVIRONMENTAL QUALITY

WESTERN REGION

December 23, 1994

Mr. Steve Hall
Director of Public Works
City of Ashland
20 East Main Street
Ashland, OR 97520

Re: WQ-Jackson
File No. 3780

Dear Mr. Hall:

I thank you and Paul Nolte for meeting with me on December 21, 1994 to discuss the issued raised at the Ashland City Council meeting. During the Council meeting, several questions were raised that Gary Arnold and I were unable to answer at that time. The Council requested that they be allowed to postpone a decision on the proposed Mutual Agreement and Order (MAO) until these questions are answered.

These questions centered around the Total Maximum Daily Loads (TMDLs), the Waste Load Allocations (WLAs) and the computer model used to arrive at these limits. Since Gary and I were not involved in the development of the limits or the computer model, we have asked the staff involved to come to Ashland to respond to these concerns.

In order to reach all interested people, we will hold a public meeting to present information on the water quality of Bear Creek and the development of the TMDLs, the WLAs and the computer models. We will also include a discussion on seasonal flows in Bear Creek. Immediately following our presentation, we will have a question/answer session.

I have reserved the Ashland City Council chambers on January 12, 1994 for this purpose. No time has been set, but we expect it to be in the early evening. Please get back to me with your time preference.

Please present this letter at the next City Council meeting.

Should you have any questions, please feel free to contact me at 776-6010 x230.

Sincerely,

Jonathan Gasik

Jonathan Gasik, P.E.
Environmental Engineer

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Medford, OR 97501
(503) 776-6010
FAX (503) 776-6262

DEQ/SWR 103

BROWN AND CALDWELL

December 22, 1994

Mr. Steve Hall
Public Works Director
City of Ashland
20 East Main Street
Ashland, Oregon 97520

13-4384

Subject: Cost Effective Analysis — Wastewater Facilities Plan Facilities Plan

Dear Mr. Hall:

During a council work session on October 24, 1994, we discussed at length the Department of Environmental Quality (DEQ) permit limits for discharge to Bear Creek. We were asked to develop for the council a summary of the permit limits, the associated treatment requirements, and their associated costs. The purpose of this exercise was to assist the council in judging the environmental benefits which would accrue from each additional treatment step.

The analysis begins with a summary of the permit limits. Four basic treatment increments are then presented along with their expected performance and cost.

PERMIT LIMITS AND REQUIREMENTS

The DEQ discharge limits for Bear Creek address a large number of constituents and are somewhat complicated. They can be found in their complete form in OAR 340-41-362, 340-41-375, and 340-41-385. Exhibit A includes a condensed version of these regulations. Many of the requirements vary in relation to flow in Bear Creek. For the purposes of discussion, the permit limits can be divided into four general categories. These permit categories and the related environmental concerns are presented below.

Organic/Ammonia Contaminants

The oxygen demand exerted by contaminants in the effluent are limited by the stream standards. This includes both biochemical oxygen demand (BOD) as well as ammonia. Both pollutants extract oxygen from the stream during their decomposition. Oxygen depletion will impact fisheries and encourage growth of undesirable vegetation. In addition, ammonia is know to be toxic to many forms of aquatic life. To prevent this process these contaminants are degraded biologically in the treatment plant.

Environmental Engineering And Consulting • Analytical Services
1025 Willamette Street, Suite 300, Eugene, OR 97401-3199
(503) 686-9915 Fax (503) 686-1417

Permit requirements limit the amount of organic and ammonia loading allowable in Bear Creek as shown in Table 1.

Table 1. Organic/Nitrogen Limits

Parameter	Seasonal applicability	In-Stream limit
CBOD, mg/L	Summer	3.0
	Winter	2.5 (h)
CBOD + NBOD, mg/L	Summer	3.0
	Winter	2.5 (h)
Ammonia-N, mg/L	Summer	0.25
	Winter	1.0

Chlorine

Either liquid and gaseous chlorine have been traditionally used to disinfect effluent prior to discharge to receiving waters. Elevated levels of chlorine are toxic to many elements of the stream biological community. In particular, fish spawning can be interrupted due to relatively low levels of chlorine. Ashland's permit requirements limit the concentration of chlorine to 0.011 milligram per liter (mg/L) both in winter and summer.

Phosphorus

Phosphorus is one of the primary nutrient sources for aquatic growth in streams. Excess available phosphorus can cause algal blooms which will remove oxygen from the stream and depress the pH. The DEQ has established 0.08 mg/L as the phosphorus concentration in Bear Creek upstream of the treatment plant. While it is unclear what phosphorus level will stimulate aquatic growth, the DEQ has taken the conservative approach of requiring the plant effluent to not exceed background phosphorus levels in the stream. Therefore, the summer requirement for phosphorus is 0.08 mg/L for discharge from the plant. There are no winter limits on phosphorus due to the increased stream flows and lower water temperatures.

Temperature

Elevated water temperatures are known to impede fish spawning, hence, the DEQ has established a maximum desired stream temperature of 58 degrees F. At stream temperatures below 58 degrees F, the effluent can increase the stream temperature by no more than 2 degrees F. At stream temperatures above 58 degrees F, no increase in stream temperature is allowed.

Level 4 Effluent Reclamation

Level 4 is a DEQ designation of effluent quality. It represents the highest level of treatment for irrigation purposes and means the effluent can be used for most irrigation applications. The DEQ has not indicated that Level 4 effluent will be required for discharge to the Talent Irrigation District (TID) canal. It is assumed that Level 4 effluent will be required by TID prior to discharge to their system.

Table 2 shows the treatment requirements and public access constraints of a Level 4 effluent.

Table 2. Treatment and Monitoring Requirements for Use of Reclaimed Water. (From OAR 340-55 — Use of Reclaimed Water from Sewage Treatment Plants)

Category	Level I	Level II	Level III	Level IV
Biological Treatment	X	X	X	X
Disinfection		X	X	X
Clarification				X
Coagulation				X
Filtration				X
Public Access	Prevented (fences gates, locks)	Controlled (signs, rural or nonpublic lands)	Controlled (signs, rural or nonpublic lands)	No direct public contact during irrigation cycle

TREATMENT ALTERNATIVE COMPONENTS

Four treatment alternatives would be employed to comply with the discharge permit limits described above. The categories include a base treatment plant upgrade project, wetlands for temperature attenuation, a phosphorus removal system, and treatment to Level 4 effluent reuse standards.

Treatment Plant Upgrade. Improvements to the existing wastewater treatment plant would allow the city to comply with discharge limits for organic constituents (BOD), ammonia, and chlorine residuals. The plant's current activated sludge treatment process would be retained.

To comply with discharge limits for organics and ammonia, new aeration basins and a new secondary clarifier would be constructed. In addition, the plant's existing aeration basins would be modified to improve performance. The aeration basins would convert both organics and ammonia into harmless by-products. The basins would be sized to ensure compliance with discharge limits, even during the winter months, when low temperatures impair the performance of biological treatment systems. The new secondary clarifier would increase solids removal efficiency and enhance reliability.

Two options exist to prevent the discharge of toxic chlorine residuals. One option is to remove chlorine prior to discharge with a sulfur-based chemical such as sulfur dioxide. Sulfur dioxide reacts with chlorine to form chlorides and sulfates both of which are harmless at low concentrations. Sulfur dioxide is available in both gaseous and liquid forms. An alternative means of disinfection, such as ultraviolet (UV) light, would end the use of chlorine altogether. UV irradiation prevents microorganisms from reproducing by altering their DNA structure. Due to both environmental and safety concerns, many wastewater treatment plants are converting from chlorine to UV disinfection. However, at this time chlorine is almost universally used at plants that provide effluent for irrigation because chlorine residuals can be continuously monitored, providing a positive indication that the disinfection process is functioning properly. This treatment plant upgrade will produce a Level 3 effluent as shown on Table 2.

Other major improvements to the liquid stream treatment process include modifying the primary clarifier, constructing a new blower building, and installing aeration blowers.

Improvements to the plant's solids management program are also needed. Proper solids treatment and handling is critical to the performance of a wastewater treatment plant. Sludge must be removed from the plant consistently to ensure compliance with discharge permit limits. In general terms, a successful solids management program consists of three components: treatment, storage during wet weather, and beneficial reuse. The following improvements are recommended:

- Constructing a new anaerobic digester and control building. The new digester would increase the plant's solids treatment capacity.

- Installing a new sludge thickening system. A thickener would enhance the performance of the anaerobic digesters.

- Constructing a facultative sludge lagoon. The lagoon would provide storage during wet weather.

- Purchasing a new sludge truck. The new truck would allow the plant to continue its successful program of sludge reuse on agricultural land as a soil amendment.

Wetlands

The primary treatment function of wetlands at the Ashland wastewater treatment plant would be to reduce the temperature of the treatment plant effluent. Unfortunately, it is difficult to accurately predict the effects of a wetland on effluent temperature. Site specific factors such as ambient air temperature, wind direction and speed, surrounding topography, and vegetation type and density all affect wetlands water temperature. During certain conditions wetlands may actually increase effluent temperature.

Wetlands also provide a degree of additional effluent treatment commonly referred to as polishing. Ammonia, BOD, and solids concentrations can all be reduced. The degree of treatment provided will vary seasonally.

Other benefits of wetlands include the creation of wildlife habitat, educational and recreational opportunities, and increased public awareness.

Phosphorus Removal System

To attain the effluent phosphorus limit of 0.08 mg/L, the treatment system would likely employ chemical precipitation of phosphorus. Biological phosphorus removal systems normally can only achieve effluent phosphorus concentrations of 1 to 2 mg/L. The plant effluent currently contains approximately 4 to 6 mg/L of phosphorus. The proposed phosphorus removal system would utilize both biological and chemical methods. The system would consist of all of the components in the treatment plant upgrade described previously as well as the following:

- A new primary clarifier.
- A chemical addition and mixing system.
- A recycle pumping system for biological phosphorus removal.
- Tertiary clarifiers for chemical phosphorus precipitation.
- Tertiary filters to remove the phosphorus associated with solids.
- Sludge gravity thickeners.

A soil treatment system may be an alternative to the chemical phosphorus removal system described above. Certain types of soils absorb phosphorus due to their chemical makeup and electrical charge. With a soil treatment system, plant effluent would be applied to a large bed of soil with the appropriate chemical properties. Phosphorus in the effluent would absorb into the soil. After percolating through the soil the treated effluent would be collected and discharged. Over time all of the sorption sites on the soil would become filled and the soil would be replaced.

At this time there are no full-scale soil treatment systems in operation. Therefore, prior to construction of the system, an extensive pilot study should be performed to ascertain whether a soil treatment system could treat plant effluent to the required levels. In addition, information about operation and maintenance costs, soil replacement intervals, and construction costs would be gathered.

To attain a Level 4 effluent, chemical addition and filtration must be added to the basic plant upgrade. Chemicals such as alum are added in mixing chambers upstream of the filters to aid in coagulation and enhance filter efficiencies. The filters will use a media of both sand and anthracite to remove minute suspended solids. This operation will result in lower effluent BOD concentrations. Disinfection efficiencies downstream of the filters are also improved.

COST BENEFIT SUMMARY

Table 3 shows the incremental costs associated with compliance of each permit requirement. It should be noted that the costs for each alternative are still being refined slightly. For consistency, we have used the 1991 Draft Facilities Plan and the 1994 Woodward-Clyde Facilities Plan Addendum costs updated with the current cost index.

Table 3. Cost Comparison of Treatment Alternatives

Discharge parameter	Treatment project	Cost,[d] $1,000
BOD,[a] Ammonia, Chlorine	Plant upgrade	10,508
Temperature	Wetland[b,e]	5,227
Phosphorus	Phosphorus removal [b,c]	13,281
Level IV reclaimed water	Level IV treatment [b,f]	4,412

Notes:

[a] BOD, ammonia, and chlorine discharges would all require an indentical plant upgrade project.

[b] Costs shown are incremental costs to be added to cost of base Plant Upgrade project to address either temperature, phosphorus, or Level IV treatment.

[c] Assumes chemical/biological phosphorus removal system. Phosphorus removal costs could be substantially reduced if pilot studies show that a soil treatment system will comply with discharge limits. Woodward-Clyde estimated cost of a seasonal soil treatment system at approximately $2 million.

[d] Costs calculated at the current Engineering News-Record construction cost index (ENR CCI) of 5450. Costs include engineering and contingency.

[e] Cost taken from the 1994 Wastewater Facilities Plan Addendum by Woodward-Clyde Consultants.

[f] Assumes effluent would be discharged to the Talent Irrigation District canals.

Please call if you have any questions regarding this analysis.

Very truly yours,

BROWN AND CALDWELL

John Holroyd
Project Manager

JEH:ps.jdc
Enclosure(s)

EXHIBIT A

TABLE 4-2
Ashland Wastewater Treatment Plant
Allowable Effluent Concentrations

Parameter	Seasonal Applicability	In-Stream Limit	Allowable Effluent Value (m)
CBOD, mg/l	Summer	3.0	3.00 (a,c,f,v,s)
	Winter	2.5 (h)	7.8 (b,d,f,q)
CBOD + NBOD, mg/l	Summer	3.0	6.75 (a,c,f)
	Winter	2.5 (h)	7.8 (b,d,f,g,p,t)
Ammonia-N, mg/l	Summer	0.25	0.56 (a,c,f,u,v)
	Winter	1.0	1.88 (b,d,f)
Chlorine - mg/l	Summer	0.011	0.025 (a,c,f)
	Winter	0.011	0.021 (b,d,f)
Total Phosphorus, mg/l	Summer	0.08	0.08 (e)
Temperature, °F	Summer	58	75.6 (a,c,i,k)
	Winter	58	38.8 (b,d,j,l)

(a) Assumed minimum summer stream flow at point of discharge, mgd 3
(b) Assumed winter stream flow at point of discharge, mgd 3
(c) Assumed average daily summer plant flow, mgd 2.4
(d) Assumed average daily winter plant flow, mgd 3.4
(e) Assumes background concentration equal to or higher than in-stream limit
(f) Assumes zero background concentration
(g) Current CBOD+NBOD winter discharge, ppd 1552
(h) Measured at Kirtland Road in Medford
(i) Assumed summer stream temperature, °F 75
(j) Assumed winter stream temperature, °F 35
(k) Allowable summer temperature increase, °F 0.25
(l) Allowable winter temperature increase, °F 2
(m) Assumes discharge to Bear Creek
(n) Average values for January 1991 through April 1992
(o) Expected average values
(p) Limit based on the lesser of current mass discharges of CBOD+NBOD from WWTP divided by future plant flow, and allowable CBOD + allowable (NH_3 times 4.35)
(q) Limit based on the lesser of 30 mg/l or the allowable CBOD+NBOD
(r) CBOD mass limit (streamflow<10 cfs), ppd 59
(s) Limit based on the lesser of allowable CBOD+NBOD or CBOD mass discharge limit
(t) CBOD+NBOD mass limit (streamflow<70 cfs), ppd 220
(u) NH_3 mass limit (streamflow<10 cfs), ppd 11
(v) Limit based on the lesser of instream limit and mass limit

Source: Brown & Caldwell Consultants

Memorandum

January 12, 1995

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: Staff Report, Brown and Caldwell Information/Presentation

ACTION REQUESTED

City Council receive presentation from John Holroyd of Brown and Caldwell which will include letter on phased cost, updated costs for 3 options outlined in this memorandum and graphics for public information process.

BACKGROUND

In the Council packet (1/3/95) I included a letter from John Holroyd on cost of phases for the wastewater treatment plant upgrade. Since I had no response from the Council requesting additional information, the letter is presented for your consideration and discussion. In addition, upgraded costs for the three options outlined in the previous, and this memorandum, will be given to you as soon as possible. Similarly, the graphics for presentation in a public forum are being completed. At this time, I believe the costs may not be available until the 1/17/95 Council meeting. The graphics will not be available until the Council meeting.

STAFF COMMENTS

[Comments same as presented in memorandum to Council at 1/3/95 meeting with one change as outlined in option 2.]

As I noted at the last Council meeting, a key decision should be made by the Council. The decision is whether Ashland will continue to consider an option which will allow year around discharge to Bear Creek. I have a concern for year around discharge. The concern is the ability of either a tertiary treatment plant or a combination of wetlands and soil filtration to consistently meet summer standards. Based on my review of the options, I cannot recommend either solution to the Council because neither option has a proven track record.

If Council elects not to pursue a year around discharge option, I believe that there are only three candidates available for serious consideration. I have dropped our "alphabet soup" system for this review. The first two options I consider a "toss up". The third option I have some reservations.

OPTION 1 requires a major upgrade to the wastewater treatment plant with winter discharge to Bear Creek and summer discharge to the Talent Irrigation District (TID) canal near Oak Street. A gallon-for-gallon exchange with TID stored provides a "no loss" condition for Bear Creek. The TID Board of Directors has expressed a concern for their customers with the use of reclaimed water. In that light, a 25 acre wetland and a Level IV effluent probably will be required to satisfy TID and their customers. A minimum addition to the major plant upgrade would be a 25 acre pond to store water during the spring and fall "windows" of time between the summer standards and the TID irrigation season. The TID exchange option meets the Council's written goal of not reducing flows in Bear Creek.

OPTION 2 is similar to Option 1 but would have summer discharge applied as spray irrigation to approximately 750 acres of land. The costs assume City purchases the land. The land could be used in a positive manner by producing a grass crop. A 20 acre storage pond would be required to balance the effluent flow with available irrigation days. If wetlands are deemed a value to the community by the Council ~~the pond could be constructed as wetlands~~ could be incorporated as a visual buffer to the storage pond and provide habitat for wildlife [Wetlands must be maintained at a relatively constant level and the fluctuations required for the storage pond would destroy a wetland]. The initial investigation of property for this option included 1300 acres. Of the 1300 acres, portions of 520 acres have TID stored water rights totalling 708 acre-feet of stored water. These water rights have a priority date of 1915, the same as all other agriculture stored water rights in the Bear Creek basin. The following table gives the volumes available for given durations, assuming different scenarios for percent of water available from storage. I am not aware of the allocation falling below 80% in the past seven years. As a general rule, 2 months supply would fill the low flow gap after TID stopped flowing water in Bear Creek until the first rains of the fall season.

Percent Stored Water Available	100%*	90%*	75%*
Length of Time Water Supplied to Bear Creek	Volume Available in MGD **	Volume Available in MGD **	Volume Available in MGD **
2 Months	3.85	3.46	2.89
3 Months	2.54	2.29	1.90
4 Months	1.92	1.73	1.44
5 Months	1.54	1.39	1.15

* Water available based on % reservoirs are full less a reserve

** Million Gallons per day

OPTION 3 would contemplate the raising of the existing wastewater treatment plant and constructing a pump station and approximately 7 miles of sewer line. Ashland's effluent would be transported by the Bear Creek Valley Sanitary Authority (BCVSA) system to the Medford Wastewater Plant. My main concern with this option is the permanent removal of approximately 2 million gallons of water a day from the upper reaches of Bear Creek and the City of Ashland. Part of my reservations towards this option is the future need for drinking water for the ensuing generations. Technology is available to produce drinking water from the effluent. Cost, public acceptance, and other less costly options for drinking water, do not make this an attractive alternative at this point in time. The Medford Reclamation Project holds promise for replacement of the treated effluent removed from Bear Creek.

Medford Reclamation Project: The approximate construction cost for the project is $15,000,000 with annual operating costs estimated at $60,000. This does not include costs which either the Medford Irrigation District (MID) or Rogue River Valley Irrigation District (RRVID) may have to invest if their existing canal system is inadequate to transport the reclaimed water.
Howard Prairie has a capacity of 60,000 acre-feet which is split TID (48,000 acre-feet), MID (8,000 acre-feet) and RRVID (4,000 acre-feet). With the Medford Reclamation Project all or a portion of the 12,000 acre-feet assigned to MID and RRVID could be redistributed for instream, agriculture and municipal use. There would be legal hurdles to overcome involving the three irrigation districts, the Oregon Water Resources Department and the U.S. Bureau of Reclamation.

SUMMARY

The decision is not a simple or an easy one for the Council. The impacts are far reaching as they set a commitment for the future of Ashland and Bear Creek while severely restricting Ashland's ability to finance any other projects for the next 20 years.

cc: Jonathan Gasik, P.E., Environmental Engineer, DEQ Medford
John Holroyd, P.E., Brown and Caldwell Consulting Engineers
John Davis, P.E., Woodward-Clyde Consultants
Dennis Barnts, Water Quality Superintendent
Gary Schrodt, Ashland Wetlands Coalition
Nancy Abelle, Ashland Clean Air Coalition
Ron Roth, Eagle Mill Farm

Enc: Holroyd letter (12/22/94)

BROWN AND CALDWELL

RECEIVED
DEC 27 1994
CITY OF ASHLAND

December 22, 1994

Mr. Steve Hall
Public Works Director
City of Ashland
20 East Main Street
Ashland, Oregon 97520

13-4384

Subject: Cost Effective Analysis — Wastewater Facilities Plan Facilities Plan

Dear Mr. Hall:

During a council work session on October 24, 1994, we discussed at length the Department of Environmental Quality (DEQ) permit limits for discharge to Bear Creek. We were asked to develop for the council a summary of the permit limits, the associated treatment requirements, and their associated costs. The purpose of this exercise was to assist the council in judging the environmental benefits which would accrue from each additional treatment step.

The analysis begins with a summary of the permit limits. Four basic treatment increments are then presented along with their expected performance and cost.

PERMIT LIMITS AND REQUIREMENTS

The DEQ discharge limits for Bear Creek address a large number of constituents and are somewhat complicated. They can be found in their complete form in OAR 340-41-362, 340-41-375, and 340-41-385. Exhibit A includes a condensed version of these regulations. Many of the requirements vary in relation to flow in Bear Creek. For the purposes of discussion, the permit limits can be divided into four general categories. These permit categories and the related environmental concerns are presented below.

Organic/Ammonia Contaminants

The oxygen demand exerted by contaminants in the effluent are limited by the stream standards. This includes both biochemical oxygen demand (BOD) as well as ammonia. Both pollutants extract oxygen from the stream during their decomposition. Oxygen depletion will impact fisheries and encourage growth of undesirable vegetation. In addition, ammonia is know to be toxic to many forms of aquatic life. To prevent this process these contaminants are degraded biologically in the treatment plant.

Environmental Engineering And Consulting • Analytical Services
1025 Willamette Street, Suite 300, Eugene, OR 97401-3199
(503) 686-9915 Fax (503) 686-1417

Permit requirements limit the amount of organic and ammonia loading allowable in Bear Creek as shown in Table 1.

Table 1. Organic/Nitrogen Limits

Parameter	Seasonal applicability	In-Stream limit
CBOD, mg/L	Summer Winter	3.0 2.5 (h)
CBOD + NBOD, mg/L	Summer Winter	3.0 2.5 (h)
Ammonia-N, mg/L	Summer Winter	0.25 1.0

Chlorine

Either liquid and gaseous chlorine have been traditionally used to disinfect effluent prior to discharge to receiving waters. Elevated levels of chlorine are toxic to many elements of the stream biological community. In particular, fish spawning can be interrupted due to relatively low levels of chlorine. Ashland's permit requirements limit the concentration of chlorine to 0.011 milligram per liter (mg/L) both in winter and summer.

Phosphorus

Phosphorus is one of the primary nutrient sources for aquatic growth in streams. Excess available phosphorus can cause algal blooms which will remove oxygen from the stream and depress the pH. The DEQ has established 0.08 mg/L as the phosphorus concentration in Bear Creek upstream of the treatment plant. While it is unclear what phosphorus level will stimulate aquatic growth, the DEQ has taken the conservative approach of requiring the plant effluent to not exceed background phosphorus levels in the stream. Therefore, the summer requirement for phosphorus is 0.08 mg/L for discharge from the plant. There are no winter limits on phosphorus due to the increased stream flows and lower water temperatures.

Temperature

Elevated water temperatures are known to impede fish spawning, hence, the DEQ has established a maximum desired stream temperature of 58 degrees F. At stream temperatures below 58 degrees F, the effluent can increase the stream temperature by no more than 2 degrees F. At stream temperatures above 58 degrees F, no increase in stream temperature is allowed.

Level 4 Effluent Reclamation

Level 4 is a DEQ designation of effluent quality. It represents the highest level of treatment for irrigation purposes and means the effluent can be used for most irrigation applications. The DEQ has not indicated that Level 4 effluent will be required for discharge to the Talent Irrigation District (TID) canal. It is assumed that Level 4 effluent will be required by TID prior to discharge to their system.

Table 2 shows the treatment requirements and public access constraints of a Level 4 effluent.

Table 2. Treatment and Monitoring Requirements for Use of Reclaimed Water. (From OAR 340-55 — Use of Reclaimed Water from Sewage Treatment Plants)

Category	Level I	Level II	Level III	Level IV
Biological Treatment	X	X	X	X
Disinfection		X	X	X
Clarification				X
Coagulation				X
Filtration				X
Public Access	Prevented (fences gates, locks)	Controlled (signs, rural or nonpublic lands)	Controlled (signs, rural or nonpublic lands)	No direct public contact during irrigation cycle

TREATMENT ALTERNATIVE COMPONENTS

Four treatment alternatives would be employed to comply with the discharge permit limits described above. The categories include a base treatment plant upgrade project, wetlands for temperature attenuation, a phosphorus removal system, and treatment to Level 4 effluent reuse standards.

Treatment Plant Upgrade. Improvements to the existing wastewater treatment plant would allow the city to comply with discharge limits for organic constituents (BOD), ammonia, and chlorine residuals. The plant's current activated sludge treatment process would be retained.

To comply with discharge limits for organics and ammonia, new aeration basins and a new secondary clarifier would be constructed. In addition, the plant's existing aeration basins would be modified to improve performance. The aeration basins would convert both organics and ammonia into harmless by-products. The basins would be sized to ensure compliance with discharge limits, even during the winter months, when low temperatures impair the performance of biological treatment systems. The new secondary clarifier would increase solids removal efficiency and enhance reliability.

Two options exist to prevent the discharge of toxic chlorine residuals. One option is to remove chlorine prior to discharge with a sulfur-based chemical such as sulfur dioxide. Sulfur dioxide reacts with chlorine to form chlorides and sulfates both of which are harmless at low concentrations. Sulfur dioxide is available in both gaseous and liquid forms. An alternative means of disinfection, such as ultraviolet (UV) light, would end the use of chlorine altogether. UV irradiation prevents microorganisms from reproducing by altering their DNA structure. Due to both environmental and safety concerns, many wastewater treatment plants are converting from chlorine to UV disinfection. However, at this time chlorine is almost universally used at plants that provide effluent for irrigation because chlorine residuals can be continuously monitored, providing a positive indication that the disinfection process is functioning properly. This treatment plant upgrade will produce a Level 3 effluent as shown on Table 2.

Other major improvements to the liquid stream treatment process include modifying the primary clarifier, constructing a new blower building, and installing aeration blowers.

Improvements to the plant's solids management program are also needed. Proper solids treatment and handling is critical to the performance of a wastewater treatment plant. Sludge must be removed from the plant consistently to ensure compliance with discharge permit limits. In general terms, a successful solids management program consists of three components: treatment, storage during wet weather, and beneficial reuse. The following improvements are recommended:

- Constructing a new anaerobic digester and control building. The new digester would increase the plant's solids treatment capacity.

- Installing a new sludge thickening system. A thickener would enhance the performance of the anaerobic digesters.

- Constructing a facultative sludge lagoon. The lagoon would provide storage during wet weather.

- Purchasing a new sludge truck. The new truck would allow the plant to continue its successful program of sludge reuse on agricultural land as a soil amendment.

Wetlands

The primary treatment function of wetlands at the Ashland wastewater treatment plant would be to reduce the temperature of the treatment plant effluent. Unfortunately, it is difficult to accurately predict the effects of a wetland on effluent temperature. Site specific factors such as ambient air temperature, wind direction and speed, surrounding topography, and vegetation type and density all affect wetlands water temperature. During certain conditions wetlands may actually increase effluent temperature.

Wetlands also provide a degree of additional effluent treatment commonly referred to as polishing. Ammonia, BOD, and solids concentrations can all be reduced. The degree of treatment provided will vary seasonally.

Other benefits of wetlands include the creation of wildlife habitat, educational and recreational opportunities, and increased public awareness.

Phosphorus Removal System

To attain the effluent phosphorus limit of 0.08 mg/L, the treatment system would likely employ chemical precipitation of phosphorus. Biological phosphorus removal systems normally can only achieve effluent phosphorus concentrations of 1 to 2 mg/L. The plant effluent currently contains approximately 4 to 6 mg/L of phosphorus. The proposed phosphorus removal system would utilize both biological and chemical methods. The system would consist of all of the components in the treatment plant upgrade described previously as well as the following:

- A new primary clarifier.
- A chemical addition and mixing system.
- A recycle pumping system for biological phosphorus removal.
- Tertiary clarifiers for chemical phosphorus precipitation.
- Tertiary filters to remove the phosphorus associated with solids.
- Sludge gravity thickeners.

A soil treatment system may be an alternative to the chemical phosphorus removal system described above. Certain types of soils absorb phosphorus due to their chemical makeup and electrical charge. With a soil treatment system, plant effluent would be applied to a large bed of soil with the appropriate chemical properties. Phosphorus in the effluent would absorb into the soil. After percolating through the soil the treated effluent would be collected and discharged. Over time all of the sorption sites on the soil would become filled and the soil would be replaced.

At this time there are no full-scale soil treatment systems in operation. Therefore, prior to construction of the system, an extensive pilot study should be performed to ascertain whether a soil treatment system could treat plant effluent to the required levels. In addition, information about operation and maintenance costs, soil replacement intervals, and construction costs would be gathered.

To attain a Level 4 effluent, chemical addition and filtration must be added to the basic plant upgrade. Chemicals such as alum are added in mixing chambers upstream of the filters to aid in coagulation and enhance filter efficiencies. The filters will use a media of both sand and anthracite to remove minute suspended solids. This operation will result in lower effluent BOD concentrations. Disinfection efficiencies downstream of the filters are also improved.

COST BENEFIT SUMMARY

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e Cost taken from the 1994 Wastewater Facilities Plan Addendum by Woodward-Clyde Consultants.

f Assumes effluent would be discharged to the Talent Irrigation District canals.

Please call if you have any questions regarding this analysis.

Very truly yours,

BROWN AND CALDWELL

John Holroyd
Project Manager

JEH:ps.jdc
Enclosure(s)

TABLE 4-2
Ashland Wastewater Treatment Plant
Allowable Effluent Concentrations

Parameter	Seasonal Applicability	In-Stream Limit	Allowable Effluent Value (m)
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	Winter	2.5 (h)	7.8 (b,d,f,q)
CBOD + NBOD, mg/l	Summer	3.0	6.75 (a,c,f)
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Chlorine - mg/l	Summer	0.011	0.025 (a,c,f)
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Total Phosphorus, mg/l	Summer	0.08	0.08 (e)
Temperature, °F	Summer	58	75.6 (a,c,i,k)
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(a) Assumed minimum summer stream flow at point of discharge, mgd 3
(b) Assumed winter stream flow at point of discharge, mgd 3
(c) Assumed average daily summer plant flow, mgd 2.4
(d) Assumed average daily winter plant flow, mgd 3.4
(e) Assumes background concentration equal to or higher than in-stream limit
(f) Assumes zero background concentration
(g) Current CBOD+NBOD winter discharge, ppd 1552
(h) Measured at Kirtland Road in Medford
(i) Assumed summer stream temperature, °F 75
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(l) Allowable winter temperature increase, °F 2
(m) Assumes discharge to Bear Creek
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(o) Expected average values
(p) Limit based on the lesser of current mass discharges of CBOD+NBOD from WWTP divided by future plant flow, and allowable CBOD + allowable (NH_3 times 4.35)
(q) Limit based on the lesser of 30 mg/l or the allowable CBOD+NBOD
(r) CBOD mass limit (streamflow<10 cfs), ppd 59
(s) Limit based on the lesser of allowable CBOD+NBOD or CBOD mass discharge limit
(t) CBOD+NBOD mass limit (streamflow<70 cfs), ppd 220
(u) NH_3 mass limit (streamflow<10 cfs), ppd 11
(v) Limit based on the lesser of instream limit and mass limit

Source: Brown & Caldwell Consultants

Memorandum

December 14, 1994

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director SMH.

Subject: Wastewater Treatment Plan Policy and Goals & Objectives

ACTION REQUESTED

City Council review and confirm or amend attached draft Policy and adopted Goals and Objectives.

BACKGROUND

The attached position paper you received prior to Rob Winthrop and I presenting it to Oregon Departments of Environmental Quality (DEQ), Fish and Wildlife (ODFW), Water Resources (OWRD), Agriculture (ODA), Rogue Valley Council of Governments (RVCOG) and representatives of the Bear Creek Coordination Council at a meeting held in Eugene on 11/10/94. The paper is a distillation of Rob and my understanding of Council discussions at the work session held 10/26/94.

Council tabled discussion of the position paper from the December 6, 1994 meeting until December 20, 1994.

INCREMENTAL COST REPORT

John Holroyd will have the incremental cost report prepared for presentation to the City Council at your January 3, 1995 regular meeting. The report will detail costs and benefits of the major components of a major plant upgrade, wetlands and soil filtration system. The comparison will include cost, pollutant removal and comparison of pollutant removal to the winter and summer standards for Bear Creek.

I will not be at the January 3 meeting because of personal reasons. If the Council wishes, I could make a formal presentation at your January 17 meeting.

FAX: Jonathan Gasik, Senior Environmental Engineer, DEQ
Gary Arnold, Nonpoint Source Specialist, DEQ

cc: Gary Schrodt, Ashland Wetlands Coalition
Nancy Abelle, Ashland Clean Air Coalition

Enc: Draft Council Policy
Adopted Council Goals and Objectives

CITY OF ASHLAND
COUNCIL POSITION PAPER
ASHLAND WASTEWATER TREATMENT PLANT

DRAFT: November 30, 1994

The options currently before the Council to meet mandated water quality standards in Bear Creek include the abandonment of the City's wastewater treatment plant through use of the Medford regional facility, and a variety of options for maintaining year around effluent discharge to Bear Creek likely to meet TMDL requirements. All options likely to meet TMDL mandates involve costs in the range of $30,000,000 net present value.

The following three issues are of major concern to the City Council in this selection process:

1. The central problem before the Council should be the need to improve the overall health of Bear Creek, not to comply with a particular end-of-pipe regulation.

2. There needs to be a coordinated and consistent approach to the problems of Bear Creek, both through consistency in State policy, and through coordinated, regional action by all Bear Creek stakeholders.

3. Decisions regarding expensive end-of-pipe solutions must be guided by plausible evidence that such actions will yield substantial improvements to the health of Bear Creek.

Given these premises, the City Council concluded the following:

1. Ashland must bear a major responsibility for improving the health of Bear Creek.

2. Ashland has not received convincing evidence for improvements in watershed health that would justify the costs of total compliance with TMDL regulations.

3. The Council wishes to pursue a regional approach in cooperation with all other Bear Creek stakeholders, the Department of Environmental Quality, and other State agencies that would identify and <u>fund the most cost effective measures</u> for improving the health of the entire Bear Creek system.

4. The Council does not suggest that a regional approach would necessarily result in lower costs for Ashland. Rather a jointly funded, jointly organized approach would yield greater benefits to Bear Creek for the dollars invested.

CITY OF ASHLAND

WASTEWATER TREATMENT PLANT

GOALS AND OBJECTIVES*

Adopted by the City Council

October 22, 1992

Revised/reconfirmed November 3, 1992

Revised/reconfirmed September 21, 1993

GOALS

The Ashland City Council requires the Ashland Facilities Plan to the maximum extent practicable to:

1. Satisfy Oregon Department of Environmental Quality (DEQ) standards for effluent from the Ashland Wastewater Treatment Plant (WWTP);
2. Replace the volume of WWTP effluent removed from Bear Creek;
3. Support the natural ecology of Bear Creek; and
4. Minimize capital and operating costs of the WWTP.
5. Eliminate odors created by the WWTP.

STATEMENT OF GENERAL INTENTION

The Ashland City Council will give full consideration to the possible use of multiple objective open surface wetlands technology to assist in achieving the WWTP goals.

MINIMUM OBJECTIVE

The Ashland City Council will determine whether the use of expanded open surface wetlands technology in conjunction with the Ashland Facilities Plan Alternative 3A might produce effluent which could be delivered to the Talent Irrigation District (TID) in exchange for Bear Creek water during summer months, thereby:

1. Maintaining summer water flow levels in Bear Creek, and
2. eliminating the need to establish and maintain the effluent irrigation system proposed in Alternative 3A.

ACTION ITEMS

The City Council will take the following specific actions to facilitate the achievement of the WWTP Goals by:

1. *Undertaking a program of public education which will encourage voluntary activities to reduce the level of phosphates introduced into the WWTP; and*

2. *Promptly obtain and fund a study to determine the feasibility of using multiple objective open surface wetlands to achieve the WWTP Goals.*

ASHLAND WASTEWATER TREATMENT PLANT OPTIONS
REVIEW OF CITY COUNCIL STUDY SESSION

The Ashland City Council met for a six hour study session on July 31, 1995, to develop a preferred course of action on the wastewater treatment plant (WWTP) options. During that study session, all of the alternatives and options to those alternatives were discussed.

Options Summarized as Presented:

"A" Medford Regional Option: Construct a pipeline (interceptor) to transfer raw sewage to the Medford Regional Water Reclamation Facility for treatment and further reuse.

"B" Treatment Plant Upgrades (with one of the following options): The treatment plant has been surviving on interim "band-aide" fixes and is badly in need of repairs and upgrades. It has been proposed that these upgrades happen in three phases:

Phase I: Immediate needs to keep the plant operating reliably over the next three years. This includes relocating the outfall to Bear Creek; correcting the chlorination/dechlorinization system to meet the chlorine residual limit in Bear Creek; evaluate and modify the exist aeration basins (fine bubble) to correct the ammonia problems; and necessary repairs to the headworks and primary clarifiers.

Phase II: This second phase (years 3-6) corrects associated items to meet the longer term effluent limits as the plant's treatment capacity is further constrained. During this period, plant component upgrades include a nominal growth factor for projected population growth, and will correct for state-of-the-art treatment needs. Components include new aeration basins for full nitrification capabilities; grit removal; evaluation and corrections to the existing secondary clarifiers; sludge treatment and handling improvements; and evaluation of the need for a storage lagoon.

Phase III: The final phase of this round of treatment plant upgrades looks at years 6-20, and evaluates redundancy needs, flexibility in plant operations and utilization, and efficiencies. This phase will evaluate and make recommendations for future growth and the longer term needs and resource options. Included in the evaluation will be further modifications to the solids handling; new secondary clarifier; tertiary filtration needs; and other operational needs based on plant efficiencies.

The plant upgrades will correct the immediate needs for winter discharge to Bear Creek, but will not correct the phosphorous residual for summer discharge. As such, the plant upgrades are a portion of the correction, but one of the following options would be included in a final decision:

"B-I" Spray Irrigation Without Wetlands: This option allows for treated effluent to be used as irrigation water for grass crops (or other future reuse options) during the summer when the effluent does not meet the stringent standards for release to Bear Creek. This option requires the purchase of irrigation land (approximately 700 acres) and construction of an irrigation system to apply the treated effluent. This option also necessitates the need for an evaluation of water replacement flow agreements for Bear Creek to replace the daily flow of 1.8 million gallons that the treatment plant would not be returning to the creek during the summer. This option allows for future reuse options to be evaluated such as irrigating City parks lands, cemeteries, golf courses and reduce the need / use of drinking water for irrigation, or for sale to other irrigators.

"B-II" Spray Irrigation WITH Demonstration Wetlands: This option is essentially the same as the option above, but provides the ability to evaluate wetlands as a treatment option. The difficulty with wetlands is the lack of information and specific success in this area. Wetlands have been successful in many geographical locations, yet the success at reaching and reliably maintaining a phosphorus level of 0.08 mg/l is rare. This option allows for a period of evaluation of wetlands process and the ability under specific circumstances to provide a beneficial part of the treatment plant process.

It is expected that the wetlands would begin as a "pilot/demonstration" project under controlled conditions. Initially, 3 acres of wetlands would be evaluated for approximately three years (allows time to purchase and construct the wetlands, establish the plants and approximately 18 months to study the initial results). After the initial three years, the wetlands could be further tested in the same 3 acre site, expanded or incrementally expanded to evaluate results, or it might be determined that the process is not reasonable for this area.

Toward the end of the pilot wetlands establishment time, it would be possible to test soil filtration to evaluate the capabilities for phosphorous removal. Until the pilot wetlands is handling a proportionate amount of flow, and the results of that system are measured, the additional affects of the soil filtration would not be known.

Throughout the initial testing period the "fall-back" position would be having the treated effluent from both the plant and the wetlands reused through spray irrigation during the summer months. Until reliable results are obtained from the wetlands that would suggest full compliance with DEQ effluent discharge limitations, direct discharge to Bear Creek is not feasible.

"B-III" Wetlands Alone with Discharge to Bear Creek Year Round: As explained, this option has high risk of not meeting the DEQ effluent discharge standards for phosphorous. As discussed during the study session, there are several "sub-options" including a soil filtration process or the possibility of using "leaky" wetlands for groundwater recharge. With any of these options, the risks of not reliably meeting the discharge limits for year round discharge to Bear Creek are high, and not recommended without some type of back up system. Should testing provide reliable long term results, then this option could be reevaluated in the future.

"C" Full Plant Upgrades to a Tertiary Plant: The final option discussed was the full plant upgrade to a sophisticated tertiary plant capable of meeting all of the DEQ discharge limitations. This option was essentially dropped from earlier discussion as there is still some risk involved, and because the cost was relatively much higher. However, for comparison, this option was explained during the study session. The primary benefit to this option is that all flow from the treatment plant would return to the creek year round.

Cost Summary:

The costs of each option were discussed and are summarized on the attached sheet. It is important to realize that these are relative costs and depict a general understanding of the conceptual costs. They are built upon assumptions and will provide a means of evaluation and comparison, but will be narrowed down for the final facilities report as the options are more carefully defined.

Council Debate/Questions and Direction:

The council deliberated and asked a considerable amount of questions regarding the merit of each option. A primary concern remains the need to obtain water flow agreements and the long term capability to retain the agreements. Many expressed the need to further evaluate background phosphorous levels in the creek and surrounding geology. There was unanimous support for a local solution to the wastewater treatment plant issues, and to maintain a potential long term resource with effluent reuse. All supported option "B-II" to use spray irrigation as the ultimate solution, and study wetlands for beneficial effects on the treatment process. Specific comments and discussion items are included in the meeting summary minutes.

Public Comment:

There was time for public comment built into the study session so that any questions or remaining community concerns could be brought to the Council for their review prior to the actual public hearing and final council decision. There was limited public comment, primarily from the Wetlands Coalition members and a small number of concerned citizens. The undertone was positive and supportive of a natural solution and beneficial reuse through spray irrigation.

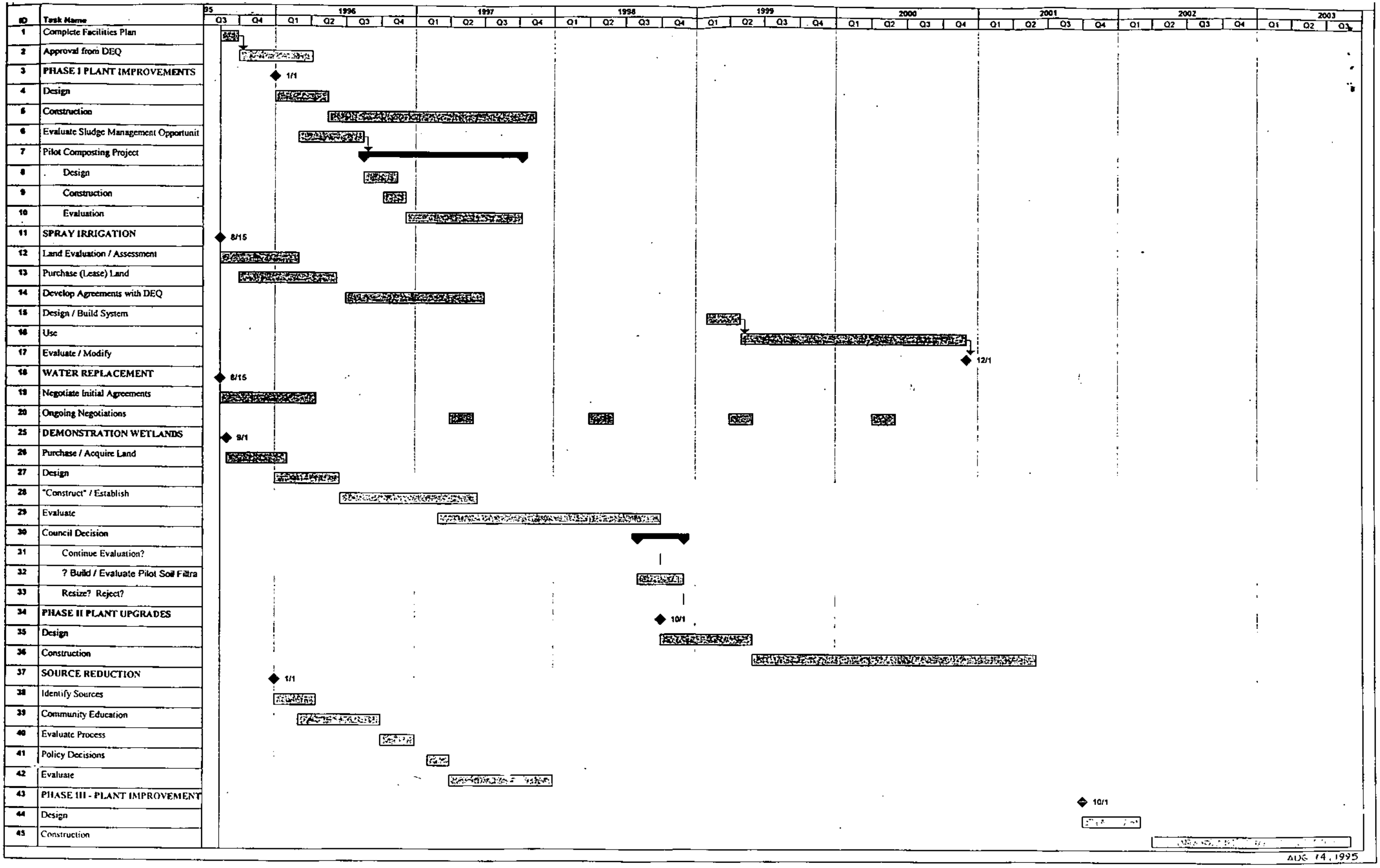
Direction:

Based on the above information, staff has proceeded to pull together a proposed schedule for approval by the City Council on August 15 and to present at the Public Hearing on August 9. It is based on Option "B-II", Plant Upgrades and Spray Irrigation with Demonstration Wetlands. Attached is a very early rendition of the schedule and process that will be fully developed for the final Facilities Plan to be completed by October 1.

ASHLAND WASTEWATER TREATMENT PLANT OPTIONS
SUMMARY OF COSTS

	MEDFORD "REGIONAL"	PLANT UPGRADE SPRAY IRRIGATION WITHOUT WETLANDS	PLANT UPGRADE SPRAY IRRIGATION WITH WETLANDS	WETLANDS ALONE FLOW TO BEAR CREEK	FULL PLANT UPGRADE TERTIARY FILTRATION
PHASE I (0-3 years)					
DESIGN / ADMIN (Plant)		$447,400	$447,400	$447,400	
CONST / CAPITAL (plant)	$21,800,000	$2,387,000	$2,387,000	$2,387,000	
IRRIGATION CAPITAL					
WETLANDS CAPITAL (pilot)			$655,000	$655,000	
PILOT SOIL FILTRATION			$80,000		
LAND ACQUISITION		$900,000	$900,000		
OTHER					
TOTAL "CAPITAL"	$21,800,000	$3,734,400	$4,469,400	$3,489,400	
OPS / MAINT (annual plant)	$581,000	$533,000	$533,000	$533,000	
OPS / MAINT (annual other)			$45,000	$45,000	
REPLACEMENT WATER (annual)	$219,000				
PHASE II (3-6 years)					
DESIGN / ADMIN (Plant)		$1,170,400	$1,170,400	$1,170,400	
CONST / CAPITAL (plant)		$6,203,000	$6,203,000	$6,203,000	
IRRIGATION CAPITAL		$2,000,000	$2,000,000		
WETLANDS CAPITAL			$2,950,000	$2,950,000	
LAND ACQUISITION					
OTHER					
TOTAL "CAPITAL'	$0	$9,373,400	$12,323,400	$10,323,400	
OPS / MAINT (annual plant)	$581,000	$625,000	$625,000	$625,000	
OPS / MAINT (annual other)		$125,500	$190,500	$190,500	
REPLACEMENT WATER (annual)	$219,000	$219,000	$219,000		
PHASE III (6-20 years)					
DESIGN / ADMIN (Plant)		$848,300	$848,300	$848,300	
CONST / CAPITAL (plant)		$4,750,300	$4,750,300	$4,750,300	
IRRIGATION CAPITAL		$1,000,000	$1,000,000		
WETLANDS CAPITAL				UNKNOWN	
LAND ACQUISITION				UNKNOWN	
OTHER				UNKNOWN TESTING	
TOTAL "CAPITAL"		$6,598,600	$6,598,600	$5,598,600	
OPS / MAINT (annual plant)	$581,000	$706,000	$706,000	$706,000	
OPS / MAINT (annual other)		$150,000	$300,000	$300,000	
REPLACEMENT WATER (annual)	$219,000	$219,000	$219,000	$219,000	
PRESENT WORTH				TOO MANY	
CAPITAL	$21,800,000	$19,706,400	$23,391,400	UNKNOWNS	$32,975,000
OPS / MAINT	$8,124,000	$9,899,600	$11,437,100	TO FULLY	$16,729,000
REPLACEMENT WATER	$2,976,000	$2,370,000	$2,370,000	EVALUATE COSTS	
SALVAGE	($1,800,000)	($1,500,000)	($2,000,000)		($1,637,000)
TOTAL	$31,100,000	$30,476,000	$35,198,500		$48,067,000

Rev: August 15, 1995
RVCOG - ASHLAND



ID
Task Name
1 Complete Facilities Plan
2 Approval from DEQ
3 PHASE I PLANT IMPROVEMENTS
4 Design
5 Construction
6 Evaluate Sludge Management Opportunit
7 Pilot Composting Project
8 Design
9 Construction
10 Evaluation
11 SPRAY IRRIGATION
12 Land Evaluation / Assessment
13 Purchase (Lease) Land
14 Develop Agreements with DEQ
15 Design / Build System
16 Use
17 Evaluate / Modify
18 WATER REPLACEMENT
19 Negotiate Initial Agreements
20 Ongoing Negotiations
25 DEMONSTRATION WETLANDS
26 Purchase / Acquire Land
27 Design
28 "Construct" / Establish
29 Evaluate
30 Council Decision
31 Continue Evaluation?
32 ? Build / Evaluate Pilot Soil Filtra
33 Resize? Reject?
34 PHASE II PLANT UPGRADES
35 Design
36 Construction
37 SOURCE REDUCTION
38 Identify Sources
39 Community Education
40 Evaluate Process
41 Policy Decisions
42 Evaluate
43 PHASE III - PLANT IMPROVEMENT
44 Design
45 Construction
95
1996
1997
1998
1999
2000
2001
2002
2003
Q1 Q2 Q3 Q4
1/1
8/15
12/1
8/15
9/1
10/1
1/1
10/1
AUG 14, 1995

MINUTES FOR THE
WASTEWATER TREATMENT PLANT UPGRADE OPTIONS
PUBLIC HEARING
AUGUST 9, 1995

CALLED TO ORDER
Mayor Golden called the Wastewater Treatment Plant (WWTP) Upgrade Options Public Hearing to order at 7:03 p.m. in the Civic Center Council Chambers. Councilors Laws, Hauck, Hagen, Winthrop, and Thompson were present. Councilor Reid was absent.

WWTP Project Coordinator Paula Brown presented WWTP options that included a review of the City Council Study Session held on July 31. (See attached.) A Summary of Costs was presented that projected each option through a 20-year period.

Public Hearing was opened at 7:20 p.m.:

Ron Roth, 6950 Old 99 South: Questioned a point on the handout from Study Session regarding the amount of spraying that would be compiled during one-year of spraying effluent. Roth also questioned the TMDL standard allowed by DEQ.

Gary Schrodt, 681 Liberty: Asked that the decision point for the spray irrigation with wetlands process would need to be identified as a Council decision to allow for possible changes in the Council makeup within the next 3 years. Noted that wetlands projects provide a possibility for grant money to be used.

John Sully, 365 Granite Street: Stated that wetlands and soil filtration would be more effective than testing either process alone.

Brown stated that the benefits will need 1 to 2 years before wetlands testing could provide clear data.

Public Works Director Steve Hall noted that by using the 3-year window for evaluation you are able to allow for weather pattern interruptions.

Roth suggested exploring the beneficial use of the spray irrigation by actively considering the cost and feasibility of using the effluent as irrigation for the newly-developed Mountain Avenue Park property.

Rick Landt, P.O. Box 874: Spoke regarding the cost of different options. Gross costs are reflected, not net costs. Options do not consider gains to the City with different choices in place.

Councilor Laws responded that the purpose of the Council's decision on the options must pertain to the gross costs only. Net costs that consider each option's benefits remain an unknown and cannot be a part of the Council's decision.

Carl Oates, 776 Glendale: Asked for flexibility to be included in the facilities plan. Suggested our timeline may be too far extended for our own good and would urge City to consider presenting a shorter time frame to DEQ to allow flexibility within the chosen option for the future. Asked for Council to consider variability of water replacement levels over the long term.

Councilor Laws stated that Council has committed to replace in the creek as much water as is removed from the creek wherever possible.

Hall agreed that the timeline needs to be kept wide open to allow for DEQ's request for a bigger picture. Internal adjustments can be made when necessary or available. Infrastructure to pipe effluent to city lands/parks is expensive, but will definitely be considered over the cost of irrigating those lands with expensive drinking-quality water.

Cate Hartzell, 881 East Main Street: Suggested mid-1998 could be used for soil filtration evaluation period.

Councilor Hagen asked that a point be included in the timeline that shows soil filtration would begin to be evaluated.

ADJOURNMENT
Public Hearing was adjourned at 8:45 p.m.

Submitted by

Rhonda E. Moore
Executive Secretary

To: City of Ashland Mayor and Council 8/15/95
From: Joe Eckhardt, speaking at public forum .
Subject: Opposition to City Plan for dealing with waste water treatment up-grading and treatment.

I am opposed to the selection by the council and city administration, and study groups formed to select a method of dealing with these problems, that have been known to exist and need for resolution for fifteen years, on the following grounds:

I. To summarily dismiss a viable option to pipe the WW to Medford to be treated and disposed of according to already DEQ accepted standards, at a much more reasonable cost than that proposed by council at this time, is frivilous and shows little attention to the financial burden on citizens of Ashland.

II. To ignore the fact that under the present proposal by the city the cost would begin at 30 million dollars,(BEFORE compliance with DEQ Standards for dealing with this effluence, and more than likely will ultimately cost considerably more when DEQ standards are met) reflects, to me, poor planning , or an intent to stubbornly hold out for local versus regional disposition of WW. We as citizens do not have to accept such a wastefull approch to a chronic problem, without furthur study as to cost and impact on our bond rating as a city.

III. This short sighted approach to just one of many considerations for future growth of our city, simply furthur demonstrates domination of Administration over city policy, and opens the door for tremendous contract letting, increased staff expenses to implement this unrealistic plan, and loads more rate charges upon citizens that already are barely able to make ends meet now!

IV. As our city financial planner, Jill Turner once admonished the council, each additional municipal bond sought, increases our bond rating risk, and may materially increse the interest rates on this city when seeking money in this fashion. Can we afford ,(by a poorly thought-out fical plan , such as this) risk placing this city in a questionable status for any other emergency need for municipal bonds in the future?

There are many other alternatives to be looked at before rushing to a decision ,as so frequently seems to be the case , when administration has its eye on a plan that costs the citizens much money.

Joe Eckhardt, 108 Bush St. Ashland OR 97520

Memorandum

August 14, 1995

To: Mayor and City Council

From: Steven Hall, Public Works Director

Subject: DEQ Amendment of Facility Plan Selection

Attached is a letter from Langdon Marsh, Director of DEQ, approving Ashland's request to change the preferred option selection for the Ashland Facility Plan to August 15, 1995.

cc: Brian Almquist, City Administrator
Peggy Christiansen, Assistant City Administrator
Paula Brown, WWTP Coordinator
Jim Olson, Assistant City Engineer
Dick Wanderscheid, Regional Affairs and Conservation
Dennis Barnts, Water Quality Superintendent

(c:\pw\deqdate.mem)

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

August 1, 1995

RECEIVED
AUG 11 1995
CITY OF ASHLAND

Steven Hall, P.E.
Public Works Director
City of Ashland
City Hall
Ashland, OR 97520

Re: Addendum No. 1 to Mutual Agreement and Order No. WQMW-WR-94-325 Jackson County File No. 3780

Dear Mr. Hall:

The Department is in receipt of your letter dated July 27, 1995 requesting an extension of time of the compliance schedule contained in Paragraph 14.A.(1) of Mutual Agreement Order No. WQMW-WR-94-325 to allow for public comment and council deliberation of treatment issues and alternatives. there will be no delay to meeting the October 1, 1995 due date for facility plan submittal. this request was received prior to the required due date, and demonstrated circumstances or events beyond the City's control.

Therefore, pursuant to Paragraph 17 of the order, the order is being amended as follows:

1. Paragraph 14.A.(1) is changed as follows:

   c. By August 15, 1995 the permittee shall select a preferred option for modifying the wastewater treatment facilities.

If you have any questions, please contact Jon Gasik at (503) 776-6010 extension 230.

Sincerely,

Langdon Marsh

Langdon Marsh
Director

DWB:mr

cc: Steve Greenwood, Western Region Administrator, DEQ
Van Kollias, Enforcement, DEQ
U.S. Environmental Protection Agency
Dennis Belsky, Western Region, DEQ

811 SW Sixth Avenue
Portland, OR 97204-139(
(503) 229-5696
TDD (503) 229-6993

DEQ-1

ASHLAND CITY COUNCIL

Study Session Minutes

July 31, 1995

City Council held a Study Session on Monday, July 31, 1995, Civic Center, Council Chambers, 1175 East Main Street, Ashland, Oregon. Council President Susan Reid called the meeting to order at 2:12 p.m.

I. **Roll Call:** Councilor Thompson, present; Councilor Reid, present; Councilor Winthrop, present; Councilor Laws, present; Councilor Hagen, present; Mayor Golden arrived at 2:14 p.m.

Also present: Paula Brown, Wastewater Treatment Coordinator; Jim Hill, City of Medford; Dennis Belsky, Department of Environmental Quality; Jon Gasik, Department Environmental Quality; John Holroyd, Brown & Caldwell; and Marc Prevost, Rogue Valley Council of Governments.

II. **Wastewater Treatment Plant Options: Presentation by Paula Brown:**

Paula Brown, Wastewater Treatment Coordinator was introduced by Mayor Golden. Brown stated the purpose for the meeting was for Council to ask questions and discuss Ashland Wastewater Treatment Options.

Brown reviewed the following questions: "What are we trying to accomplish in Bear Creek?" "What is the purpose of the corrections to the Wastewater Treatment Plant?" "Will Wetlands fit in?" She also discussed Council Goals in reference to each question (see attached).

Each Councilor had previously received a packet of information containing the following three options:

Option A) The City of Ashland would send all of its untreated sewage to Medford's Regional Water Reclamation Facility via a constructed pipeline (interceptor) and the Bear Creek Valley Sanitary Authority's regional interceptor for treatment at the Medford Regional Water Reclamation Facility for further discharge to the Rogue River or for regional reuse. Eric Dittmer reviewed and discussed this option with the City Council. The pros, cons, and unknowns were also discussed.

Option B) The Wastewater Treatment Plant upgraded and repaired to keep operating reliably over the next three years; second phase improvement would include a nominal growth component (3-6 years); last phase would take the plant beyond just meeting the effluent criteria and projects growth for up to 20 years. Brown reviewed and discussed this option with the City Council.

> Phase I: Immediate needs to keep the plant operating reliably over the next three years. This includes relocating the outfall to Bear Creek; correcting the chlorination/dechlorinization system to meet the chlorine residual limit in Bear Creek; evaluate and modify the existing aeration basins (fine bubble) to correct the ammonia problems; and necessary repairs to the headworks and primary clarifiers.

> Phase II: This second phase (3-6 years) corrects associated items to meet the longer term effluent limits as the plant's treatment capacity is further constrained. During this period, plant component upgrades include a nominal growth factor for projected population growth, and will correct for state-of-the-art treatment needs. Components include new aeration basins for full nitrification capabilities; grit removal; evaluation and corrections to the existing secondary clarifiers; sludge treatment and handling improvements; and evaluation of the need for storage lagoon.

> Phase III: The final phase of this round of treatment plant upgrades looks at years 6-20, and evaluates redundancy needs, flexibility in plant operations and utilization, and efficiencies. This phase will evaluate and make recommendations for future growth and the longer term needs and resource options. Included in the evaluation will be further modifications to the solids handling; new secondary clarifier; tertiary filtration needs; and other operational needs based on plant efficiencies.

The plant upgrades will correct the immediate needs for winter discharge to Bear Creek, but will not correct the phosphorous residual for summer discharge. As such, the plant upgrades are a portion of the correction, but one of the following options would be included in a final decision: 1) Spray Irrigation Without Wetlands; 2) Spray Irrigation WITH Demonstration Wetlands; 3) Wetlands Along with Discharge to Bear Creek Year Around.

Option C) The City of Ashland would maintain the effluent from the Wastewater Treatment Plant and reuse the flow during the late spring through early fall to lad irrigate and discharge winter flows to bear creek or use constructed wetlands as a functioning part of the wastewater treatment process. Brown reviewed and discussed this option with the City Council. The pros, cons and unknowns were also discussed.

The final option is full plant upgrade to a sophisticated tertiary plant capable of meeting all of the DEQ discharge limitations. This option was essentially dropped from earlier discussion as there is still some risk involved, and because the cost was relatively much higher. The primary benefit to this option is that all flow from the treatment plant would return to the creek year round.

Supporting documentation to the above options was in the City Council packet.

Brown distributed printed information listing of the options showing "Technical Feasibility Risk", Long-term Risk", "Financial (Cost)" relative to low, medium or high, and "Comments/Concern". She stated time frame for Option "A" is immediate to three years, Option "B" possibly three to five years, and Option "C" would take three years.

Brown Distributed information on proposed costs for each option, with corrections (see attached).

III. **City Council Review & Comments:**

Brown stated she would walk the Council through the choices and recommendations as per their request. The choices are: returning treated effluent to the creek or replacing that amount of volume in the creek; the choice of going to Medford today or not; the choice of going to Medford later. The Council deliberated and asked a considerable amount of questions regarding the merit of each option. A primary concern is the need to obtain water flow agreements and the long term capability to retain the agreements and also, the need to further evaluate background phosphorous levels in the creek and surrounding geology. The Council agreed to support a local solution to the wastewater treatment plant issues and to maintain a potential long term resource with effluent reuse. Council also agreed the that "spray irrigation" would be the best solution and study wetlands for beneficial effects on the treatment process.

IV. <u>7:00 p.m.</u>: **Public Comment**

Gary Schrodt, 681 Liberty, Ashland, commended Brian on choice of Paula Brown and RVCOG. He stated the idea of focusing on land applications is getting the cart before the horse. He recommended this be approached with testing, as the Wetlands Coalition had recommended. His concern is cost and requirements. The water is being used by the people and needs to be returned to the Watershed. Water shortages may develop into the same situation as Klamath and even more rapidly. DEQ may be looking at the Medford option as a "quick fix".

Ron Roth, 6978 Old 99 South: Commended Brown for doing an incredible job in getting things in focus. He questioned the Medford option including future upgrades and Medford receiving the phosphate levels. Jim Hill stated it was estimated at 1 milligram. Current allowed level phosphate has not been set by DEQ for the City of Medford. Belsky stated Medford is currently obtaining data. He questioned whether DEQ would require Medford to do the same as Ashland. Holroyd stated that Medford's fall-back is a spray irrigation. He also highly recommended doing the pilot program because it is an opportunity to do some real research. He said it would be something for DEQ's data base. He said as a community we need the data. Roth stated that the idea of spray irrigation combined with wetlands is trying to get rid of water by spraying. This water should be used to irrigate existing parks and the golf course. He also recommended taking care of chlorine and ammonia problems right away. His main concern is the process. Replacing the problem has always been a Council concern. His major concern is to have a minimum amount of water in the creek.

John McClanden, 105 Bush Street. He stated he has been a biochemist for the past 50 years and one of the things he has learned is that calcium phosphate is the most insoluble. You reduce phosphate before it goes into the plant or before it goes out. The use of alum and lime will reduce the phosphate. Calcium adds more than the alum method does. The research already done is that you can get 90% of the phosphate precipitated. The flow of the sewage through a bed of limestone will remove a very large amount of phosphate.

Jim Hill: He stated that the facility plan they looked at, and if the standards changed, cost would be greater, and it is highly unlikely that there would not be a reason for it. The reclamation brought the water back into the valley that was leaving. A viable option is to send it to Sams Valley. There is a back-up reclamation and that is to go to Sams Valley.

Gary Schrodt. He stated he has been concerned about what has happened at Tualatin. Gasik stated he has heard that the phosphates have come way down but reduction in water quality violations has not and DEQ is examining the possibility of higher standards. Schrodt stated that if in the testing phases, if Council decides to go that route, that phosphorus is still ambiguous, there are still unknowns. We have limited resources and if we spend money on this, will we be able to have data. Belsky stated that he does not know if there will be a mid-course change in standards. Schrodt asked if Ashland was to look at the issue that 1.8 or less is really going to work would DEQ consider this. Belsky stated if the scientific data is there they will certainly look at it.

Dennis Belsky stated that in the past the DEQ has been forward with their opinion but the flavor that they have left is that the choice is up to the Council.

V. Other Business: City Council Members

Golden stated if Council wants to close the Medford option to state reason.

Winthrop stated that based on what is known tonight that he has come to the view to leave the Medford option because he thinks it is a very significant decision. The argument is that we need to hold on to our effluent; too many unsubstantiated elements in the charges laid on the table; SDC's is also an issue; we have good options here.

Golden stated she wanted to keep it on the table because she wanted to forward to the Regional Board that the second largest City in southern Oregon would not be invited to be a part. It is difficult to hear from the Medford City Council that they do not want Ashland making their decisions. It is hard, after six years of working, to keep Medford on the table.

Hauck stated that what Golden and Winthrop had stated crystallized his decision to not use Medford. The financial part did not sway his decision.

Laws stated we need to have guaranteed fall back, and not limit our choices. The two choices we have is the Medford, and spray irrigation and he is not going to let petty politics cut that out. His prejudices is strongly in maintaining control over the effluent of Ashland. Second he thinks the regions options are still uncertainties. He thinks we are led to spray irrigation as the fall back. He would like to see studying on wetlands. He is no longer comfortable with wetlands. His choices are spray irrigation and spray irrigation with wetlands. He thinks the Council should move right away with spray irrigation.

Reid stated that she had let go of the Medford option. Because of the unknowns we are not talking about spending more money. She is happy the WWTP is using alum to reduce phosphates and she is proud of staff on this one.

Hagen stated he was pleasantly surprised to see how close the costs were. He hopes that the Council will take advantage of the three year study period. The pipe between here and Medford made him uncomfortable. He is prepared to go ahead with the wetlands with spray irrigation.

Thompson stated he favors regional approach to things but he is against this one. He wants to maintain control of our resource.

Hauck stated that what we need at this time is spray irrigation with wetlands. If we have three years, we need to test out the option with wetlands without spray irrigation.

Golden stated Winthrop has done so much work on this issue. Winthrop thanked the Mayor for her comment. He stated he is leaning in the same direction, spray irrigation. He also stated RVCOG has done a tremendous job. He thinks the issue in detail is how quickly should we move with irrigation. He thinks the job of a city government is to be informed and go with the reliable system. He is willing to drop overboard soil filtration. The focus should be getting land that is available for irrigation system and go to a level for treatment and apply it to a City facility.

Laws stated that throughout this process that the Wetlands Coalition has been a real informant. Since there is not going to be a tie vote he thinks that Reid should be allowed to vote and proceed with the schedule now set for the Council vote. Golden stated she would like to move to get this done following the public hearing on August 9th. Laws wanted to take a consensus of the Council. Winthrop stated he thought the schedule should be followed. Hauck agreed and thinks we should follow through with the advertised schedule. Thompson stated it doesn't matter if they vote on the 9th.

Hagen asked for clarification as to the filtration being basically a mud hole. Brown stated there would be three inches of water. She also stated ideal filtration is to have the smallest amount of water on top. Schrodt commented on placing a marsh on top of the soil infiltration system and that this could be compatible. Plato stated there are a number of ways to place a filtration system that would not require a large amount of land.

Hill commended the City Council for their decision and stated the City of Medford supports any decision they make in improving the water that flows into Bear Creek.

Brown stated that her thought for the August 9th meeting is to take comments and summarize them for an opening of the Public Hearing.

VI. Adjournment:

There being no further business the meeting adjourned at 8:00 p.m.

Respectfully submitted,

Caralyn Dusenberry

Caralyn Dusenberry
Administrative Secretary

ASHLAND WASTEWATER TREATMENT PLANT OPTIONS

WHAT ARE WE TRYING TO ACCOMPLISH IN BEAR CREEK?

- Watershed / Basin Concept
- Sufficiently improve flows in Bear Creek to encourage development of salmon habitat
- Evaluate the regional implications of Ashland's actions (beneficial downstream uses, Talent's drinking water, farmers/growers, fish, Regional Water Reclamation)

Council Goals:

- *"Replace the volume of WWTP effluent removed from Bear Creek"*
- *"Support the natural ecology of Bear Creek"*

WHAT IS THE PURPOSE OF THE CORRECTIONS TO THE WWTP?

Due to the basin TMDL designation, DEQ standards for point source discharges to Ashland / Bear Creek have become increasingly more stringent. Ashland is under a Mutual Agreement and Order to correct three primary concerns: Chlorine Residual; Ammonia - Nitrogen; and Sludge Management, and a fourth with proposed phosphorous limits. To do so, the WWTP must be improved and upgraded.

Council Goals:

- *"Satisfy DEQ standards for effluent from the WWTP"*
- *"Eliminate odors created by the WWTP"*
- *"Minimize capital and operating costs of the WWTP"*

WILL WETLANDS FIT IN?

Council Intent:

"... give full consideration to the possible use of multiple objective open surface wetlands technology to assist in achieving WWTP goals."

CONSIDER:

If WWTP effluent discharged to Bear Creek in the summer may not meet DEQ standards, and may cause problems for the salmon, then why not look at removing the effluent from the creek - getting the treated effluent to another beneficial use?

Desire to ensure replacement flows in Bear Creek. If the WWTP is not directly discharging into Bear Creek, there must be trades from TID, M&I rights or other water rights to replace the flows the WWTP would have normally placed in the creek. DEQ is currently working on a water rights agreement that would assure 10 cfs (6.5 mgd) in the creek at all times.

ASHLAND WASTEWATER TREATMENT PLANT OPTIONS
SUMMARY OF COSTS

	MEDFORD "REGIONAL"	PLANT UPGRADE SPRAY IRRIGATION WITHOUT WETLANDS	PLANT UPGRADE SPRAY IRRIGATION WITH WETLANDS	WETLANDS ALONE FLOW TO BEAR CREEK	FULL PLANT UPGRADE TERTIARY FILTRATION
PHASE I (0-3 years)					
DESIGN / ADMIN (Plant)		$447,400	$447,400	$447,400	
CONST / CAPITAL (plant)	$21,800,000	$2,387,000	$2,387,000	$2,387,000	
IRRIGATION CAPITAL					
WETLANDS CAPITAL			$655,000	$655,000	
LAND ACQUISITION		$900,000	$900,000		
OTHER					
TOTAL "CAPITAL"	$21,800,000	$3,734,400	$4,389,400	$3,489,400	
OPS / MAINT (annual plant)	$581,000	$533,000	$533,000	$533,000	
OPS / MAINT (annual other)			$45,000	$45,000	
REPLACEMENT WATER (annual)	$219,000				
PHASE II (3-6 years)					
DESIGN / ADMIN (Plant)		$1,170,400	$1,170,400	$1,170,400	
CONST / CAPITAL (plant)		$6,203,000	$6,203,000	$6,203,000	
IRRIGATION CAPITAL		$2,000,000	$2,000,000		
WETLANDS CAPITAL			$2,950,000	$2,950,000	
LAND ACQUISITION					
OTHER					
TOTAL "CAPITAL'	$0	$9,373,400	$12,323,400	$10,323,400	
OPS / MAINT (annual plant)	$581,000	$625,000	$625,000	$625,000	
OPS / MAINT (annual other)		$125,500	$190,500	$190,500	
REPLACEMENT WATER (annual)	$219,000	$219,000	$219,000		
PHASE III (6-20 years)					
DESIGN / ADMIN (Plant)		$848,300	$848,300	$848,300	
CONST / CAPITAL (plant)		$4,750,300	$4,750,300	$4,750,300	
IRRIGATION CAPITAL		$1,000,000	$1,000,000		
WETLANDS CAPITAL				UNKNOWN	
LAND ACQUISITION				UNKNOWN	
OTHER				UNKNOWN TESTING	
TOTAL "CAPITAL"		$6,598,600	$6,598,600	$5,598,600	
OPS / MAINT (annual plant)	$581,000	$706,000	$706,000	$706,000	
OPS / MAINT (annual other)		$150,000	$300,000	$300,000	
REPLACEMENT WATER (annual)	$219,000	$219,000	$219,000	$219,000	
PRESENT WORTH				TOO MANY	
CAPITAL	$21,800,000	$19,706,400	$23,311,400	UNKNOWNS	$32,975,000
OPS / MAINT	$8,124,000	$9,899,600	$11,437,100	TO FULLY	$16,729,000
REPLACEMENT WATER	$2,976,000	$2,370,000	$2,370,000	EVALUATE COSTS	
SALVAGE	($1,800,000)	($1,500,000)	($2,000,000)		($1,637,000)
TOTAL	$31,100,000	$30,476,000	$35,118,500	UNKNOWN!	$48,067,000

August 8, 1995
RVCOG - ASHLAND

OPTION	TECHNICAL FEASIBILITY RISK*	LONG-TERM RISK	FINANCIAL (COST)	COMMENTS/CONCERNS	TIME FRAMES
Option A: Medford "Regional"	MINIMAL	MEDIUM/HIGH	LOW (Long-Term Unknown)	• give up long-term resource • unknown long-term requirements to Medford's plant/permit • Is this the right solution for Ashland? • member vs contract • long-term relationship with BCVSA and Medford	3 YRS
Option B: Plant Upgrades					POSSIBLY 3 YRS
▸**Spray Irrigate *Without* Wetlands** winter discharge to Bear Creek	MINIMAL	MINIMAL/MEDIUM	MEDIUM	• Bear Creek exchange • no use of wetland (community impact)	
▸**Spray Irrigate *With* Wetlands** winter discharge to Bear Creek	MINIMAL	MINIMAL	MEDIUM	• Bear Creek exchange • future ability to irrigate all city park lands - minimize treated drinking water use for irrigation	
▸**Wetlands Alone** year-round discharge to Bear Creek	HIGH	MINIMAL/MEDIUM	HIGH (Long-Term Unknown)	• may be technically feasible, but has unknown or unproven results • if DEQ standard not met, would have to stop and do something else • stringent permit requirements • percent ground water recharge to Bear Creek • still need exchange	3-5 YRS
Option C: Full Upgrade	MEDIUM	MINIMAL/MEDIUM	HIGH	• costly; concrete solution	3 YRS

Memorandum

February 16, 1995

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: **Wastewater Plant Information Update**

ACTION REQUESTED

City Council:

1. Accept/modify Don Laws Background Paper
2. Accept/modify Brown and Caldwell Information Packet
3. Set process/time frames for public involvement process
4. Decide on a formal public hearing before the Council. Should this be during a normal Council meeting or a separate special meeting?

BACKGROUND

DON LAWS BACKGROUND PAPER

At the last City Council meeting, Don Laws submitted a Background Paper and a recommendation that the paper be used as a springboard for seeking public comment. I have a few suggested changes that I have discussed with Don.

1. The cost figures listed in the paper are for net present worth and I am not sure that the public would understand the meaning of that figure. I would recommend that the construction and annual operational costs be listed separately.
2. Page 2, Decision No. 2, 5th line refers to "nitrogen" which should be "phosphorous".

BROWN AND CALDWELL INFORMATION

At the January 17, 1995 Council meeting, John Holroyd presented graphics and summaries of the options for Council consideration. The Council asked that the option for year around discharge be added and that a decision tree be developed. Attached is the latest update from John Holroyd. Personally, I am quite pleased with the results and have reviewed them with Rob Winthrop.

SUGGESTED PROCESS

In order to reach as many individuals and businesses in Ashland as possible, I am suggesting the following process for Council.

1. Send Don's paper via bulk mail to all residents and businesses in Ashland. In addition, have copies available at City Hall, Public Works, the Library, Ashland High School and Southern Oregon State College.

2. Submit the letter to the Ashland Daily Tidings and Medford Mail Tribune for publication as a guest editorial.

3. Set two "informal" hearings meetings for the public to "drop in", look at the visuals and ask questions. Don Laws letter would be available and written comments would be encouraged by the attendees. Meetings would be held between 4 and 8 p.m. on two days selected by Council. John Gasik and Gary Arnold from DEQ, John Holroyd from Brown and Caldwell and myself will be present at the meetings. Would the Council wish a representative be present at the meetings?

4. City Council conduct a formal public hearing approximately one month after the informal hearings. This would allow staff the time to assemble the information received from the public and present to the Council a week prior to the public hearing.

cc: John Holroyd, P.E., Brown and Caldwell
Jonathan Gasik, P.E., Medford DEQ
Gary Arnold, Medford DEQ
Dennis Barnts, Water Quality Superintendent
Gary Schrodt, Ashland Wetland Coalition
Nancy Abelle, Ashland Clean Air Coalition
Klaas Van de Pol, League of Women Voters

Enc: Laws Background Paper
Holroyd letter 2/14/95
Holroyd Information Packet

DRAFT

COUNCIL: What changes need to be made in this draft before it is published in the newspaper?
Don L.

WASTEWATER DECISIONS: A BACKGROUND PAPER FOR INTERESTED CITIZENS

BACKGROUND

The nation's Clean Water Act requires that all streams, rivers, and lakes in the United States must be made fishable and swimable. In 1977 a study of Bear Creek determined that the creek contained a number of pollutants that were harmful to fish and must be cleaned up. That study identified the Ashland sewage treatment plant as a major source of those pollutants and recommended that the treatment process be improved. At that time the Oregon Department of Environmental Quality, which is responsible for enforcing the Clean Water Act in our state, said it was the Department's policy that "upgrading to more stringent requirements will be deferred until it is necessary to expand or otherwise modify or replace the existing treatment facilities."

A few years later a private environmental organization sued the D.E.Q., claiming that it was not enforcing the federal law requiring timely cleanup of Bear Creek and several other similar streams around the state. The judge agreed and ordered the D.E.Q. to require the appropriate polluters to begin reducing their pollutants. Ashland was notifed that it would have to reduce pollutants from sewage treatment to certain specified levels, and should immediately determine how it could do so. The city hired an engineering firm, which offered several alternatives for reaching those levels. Unfortunately, because the flow of water in Bear Creek is so low during parts of the year, there is little water to dilute the polluted water coming from the treatment plant, so the levels of pollutants that were allowed for Ashland were among the lowest anywhere in the nation. Consequently, the alternatives presented by the engineering firm were very costly. The Council was also concerned because all but one extremely expensive and still experimental alternative required that the effluent from the treatment plant be removed from Bear Creek completely during part of the year. The Council pointed out that the water left in the creek at those times would be so low that fish could not survive. It presented a real dilemma: polluted water or no water; either solution was bad for fish.

Ashland asked that the state fish and wildlife experts be consulted to see if effluent that was not quite as clean as D.E.Q. required would be better than no water at all. In the meantime, a number of Ashland-area people became interested in wetlands--ponds of water with plants that would naturally remove pollutants--and wondered if they could meet the D.E.Q. standards. The group did some initial research indicating that wetlands at least had a possiblity of working, so the city council requested an extension of time from D.E.Q. to hire more experts to determine if wetlands would work.

Ken? The result of that study was ~~that~~ wetlands by ~~themselves~~ were too "iffy" in meeting such strict pollutant requirements, but, if they ~~were combined~~ with treatment plant modifications and a process of filtering the effluent through the earth, they might be able to work. The cost of earth filtration promised to be much cheaper than the alternatives.

In the meantime, it had been determined that the removal of water from Bear Creek probably could be offset by purchasing rights to other water that could be used to replace Ashland's treatment plant effluent. The cost of the various alternatives, including replacement water and operating expenses, would run from $31 million to $38 million. If earth filtration could remove enough nitrogen from the effluent to meet the nitrogen standard, the cost could possibly be reduced to $27 million. Earth filtration would need to be tried with the type of earth availble to Ashland to determine if it could meet the standards.

Additionally, the recent droughts have made local people more aware of the importance of water as a resource. If the drought continues for a number of years, or after a few more decades of growth, Ashland will need more water, and the best source may be treated sewage effluent.

Faced with fines up to $10,000 a day for further delay, the city has signed an agreement with D.E.Q. to provide them with a preferred alternative by August ,1995, and an engineering plan by October, 1995. The Council must, therefore, make some decisions immediately.

DECISION NO. 1

One alternative that would eliminate all pollution of Bear Creek from the Ashland treatment plant would be to pipe our sewage to the Medford treatment plant and buy rights to replacement water for the creek. This would cost about $31 million. It would also result in the loss of the effluent water to Ashland forever. If this alternative is chosen, no further major decisions are necessary.

DECISION NO. 2

If Ashland chooses to hold on to its effluent water, it must decide whether to agree to one of two proven alternatives that would cost $36-38 million, or to do a pilot study on earth filtration that, if successful, would end up providing a system that might cost as little as $27 million. All three alternatives would require the same changes in the treatment plant to remove all pollutants except nitrogen. One would further require treating the water and discharging it to the Talent Irrigation District canal for use as irrigation water. The second would require somewhat less additional treatment and would then be use the water to irrigate land purchased by the city. The earth filtration alternative would require ponds from which the effluent would be filtered in a controlled manner and discharged back into Bear Creek. The first two alternatives would require replacement water for Bear Creek; earth filtration would not.

These alternatives all require major improvements to the Ashland treatment plant and would continue to involve the city in the treatment process. The earth filtration alternative would require a pilot study to determine if available earth will adequately do the job. If the pilot study fails, it would be necessary to go to one of the other alternatives and the additional expense of the study would have been incurred

SUMMARY OF ADVANTAGES AND DISADVANTAGES

1. Medford Alternative. The advantages of this alternative are a relatively certain cost of no more than $36 million, no more involvement of Ashland in the sewage treatment function, and no more chance of sewage treatment-related odor. The disadvantages are that any future use of the effluent water would be lost, and the city would have only a minor say in setting future rates. The standards for the Medford treatment plant may also be raised in the near future, forcing increased rates for all users.

2. T.I.D. Alternative. The advantages of this alternative are a relatively certain cost of $38 million, all D.E.Q. standards would be met, and Ashland would retain the effluent water for future uses. T.I.D. would trade water in its resevoirs for the water it received, so there would be replacement water for Bear Creek. The disadvantages are that it requires sensitive negotiations with T.I.D. and the federal Bureau of Reclamation, the outcome of which are not guaranteed, and it costs more than other alternatives.

3. City Land Alternative. The advantages of this alternative are a relatively certain cost of $36 million, all D.E.Q. standards would be met, and Ashland would retain the effluent water for future uses. The land purchased for irrigation with the effluent would probably have water rights that could be used to acquire replacement water for Bear Creek. The disadvantages are that the outcome of negotiations to allow the water rights to be used as replacement water are not guaranteed, and the cost would be greater than other alternatives.

4. Earth Filtration Alternative. The advantages of this alternative are that the effluent water would return directly to Bear Creek and no replacement water would have to be acquired, the water would be available for possible future uses, and if the pilot study shows the system will work, it would be the cheapest alternative at about $27 million. The disadvantages are that the pilot study will cost money and may show the method will not work, and the exact cost of earth filtration is much less certain than the other alternatives.

YOUR OPINION WOULD BE APPRECIATED

The Council must make its decision soon. If you have an opinion, write, call, or talk to us. This is not an easy problem, and there are no obviously correct answers. We have already chosen not to fight the federal law itself or the standards established by the D.E.Q., so the help we need is about what option would be best to meet this mandate.

THE ASHLAND CITY COUNCIL

BROWN AND CALDWELL

February 14, 1995

Mr. Steve Hall
Public Works Director
City of Ashland
20 East Main Street
Ashland, Oregon 97520

13-4384

Subject: Wastewaster Facilities Plan—Treatment Alternative Selection Information

Dear Mr. Hall:

We are pleased to provide you 17 information packets regarding the Ashland wastewater treatment selection process. This set compiles much of the information we have jointly developed and refined over the past several years. The first sheet of the set depicts the basic decisions to be made in selecting an alternative. Schematic drawings are also provided, showing the key features of the alternatives. The final sheet provides a detailed summary of the estimated construction cost of each alternative.

The cost summary shows both the capital and present worth costs associated with each alternative. Capital cost is simply the in-place purchase price, adjusted for inflation to the year 1998, and includes an allocation for engineering and a 25 percent contingency.

Present worth is a cost comparison method which factors in capital cost, inflation, cost of money, operation and maintenance cost, and salvage value. As such, present worth is considered a relative indicator of the life cycle cost of a facility. The economic portion of the alternative selection process involves considering both the initial capital costs as well as the long-term life cycle costs.

Sheet 1 shows the lowest capital cost alternative to be the combination of a wastewater treatment plant upgrade and a soil filtration system. This alternative also poses the highest risk due to a lack of experience with this type of facility in this country. The discharge to Medford and effluent irrigation of city-owned land alternatives show the next lowest capital costs. It should be understood that the capital costs shown should be considered accurate to + 50% or - 30% , that is, as much as 50% high or 30% low. This level of estimating accuracy is typical for this stage of the facilities planning process.

We look forward to the opportunity to discuss this information with you in person.

Very truly yours,

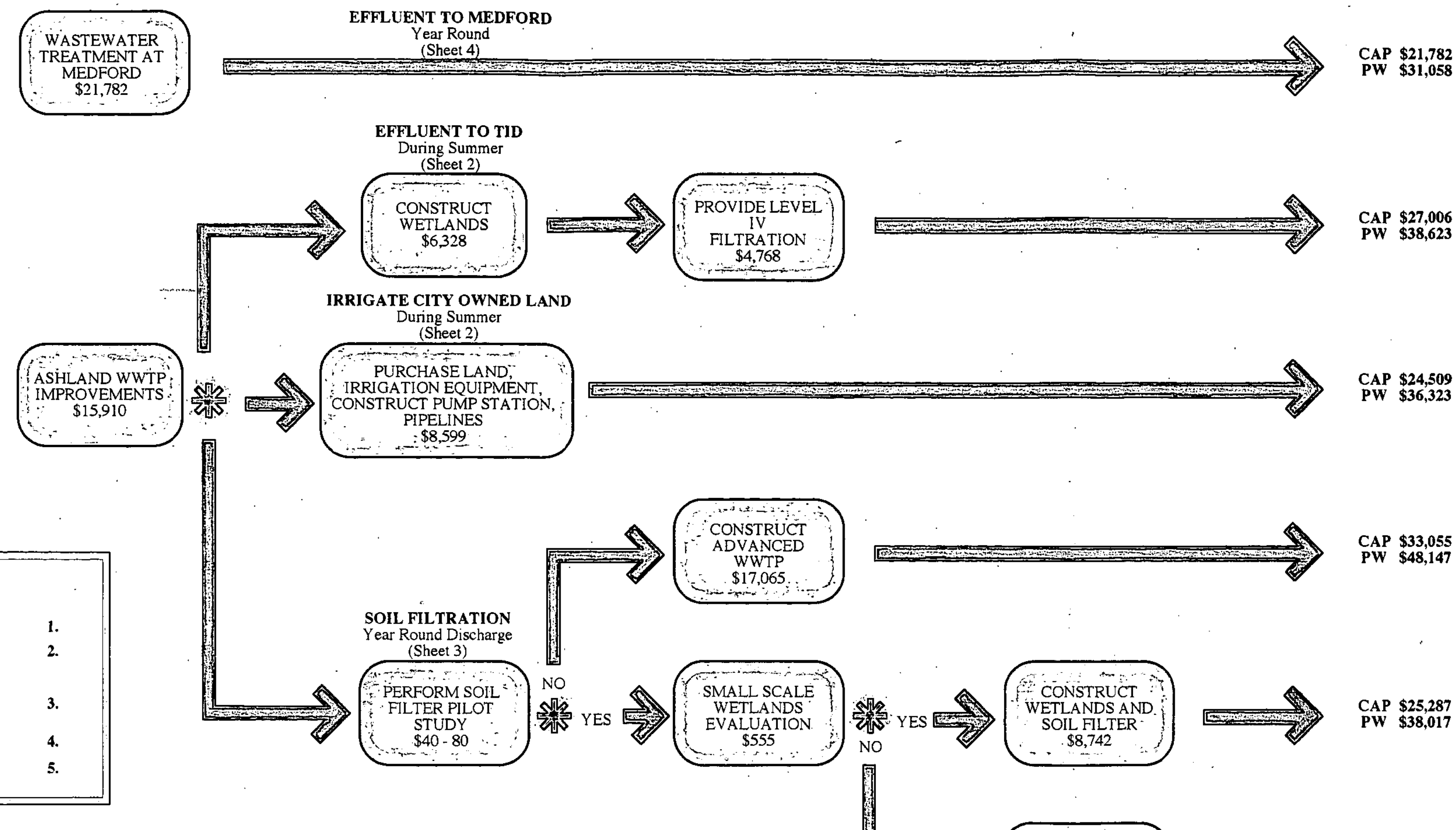
BROWN AND CALDWELL

John Holroyd
Project Manager

JEH:tpc
enclosure(s)

MEDFORD REGIONAL WASTEWATER TREATMENT

ASHLAND LOCAL WASTEWATER TREATMENT



SHEET INDEX

ALTERNATIVE DECISION PROCESS	1.
CITY OF ASHLAND AND TALENT IRRIGATION DISTRICT EFFLUENT REUSE ALTERNATIVES	2.
SOIL FILTRATION TREATMENT ALTERNATIVE	3.
MEDFORD TREATMENT ALTERNATIVE	4.
DETAILED COST ESTIMATES	5.

NOTE: All capital costs shown are in $1000 escalated to midpoint of construction

CAP = Capital Cost
PW = 20 year lifecycle / present worth cost
WWTP = Wastewater Treatment Plant
TID = Talent Irrigation District

ALTERNATIVE DECISION PROCESS

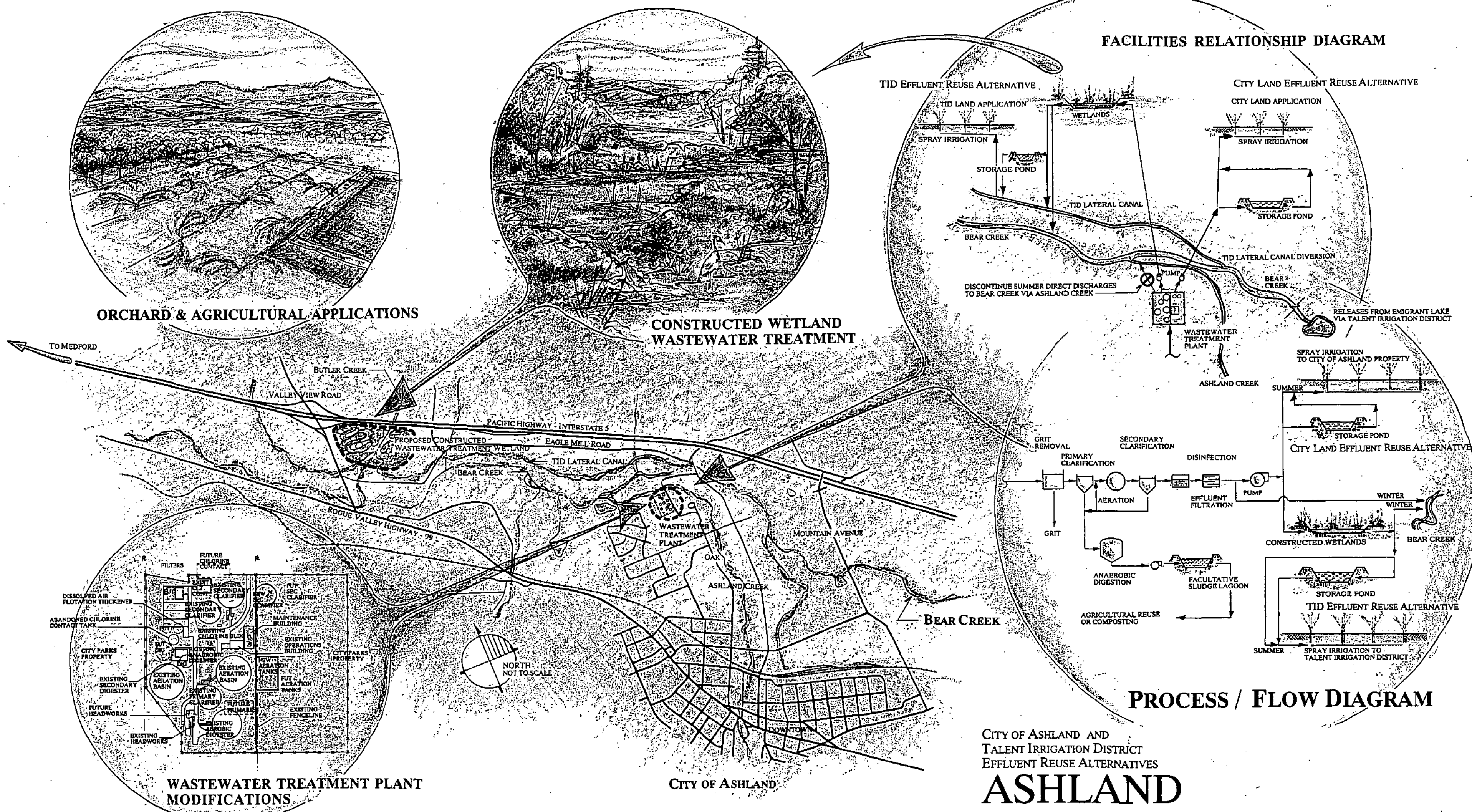
ASHLAND WASTEWATER FACILITIES PLAN

CITY OF ASHLAND, OREGON FEBRUARY 13, 1995

CAMERON McCARTHY GILBERT
LANDSCAPE ARCHITECTS
160 East Broadway Eugene Oregon 97401
Phone: 503.485.7385 Fax: 503.485.7389

BROWN & CALDWELL

1.



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GILBERT
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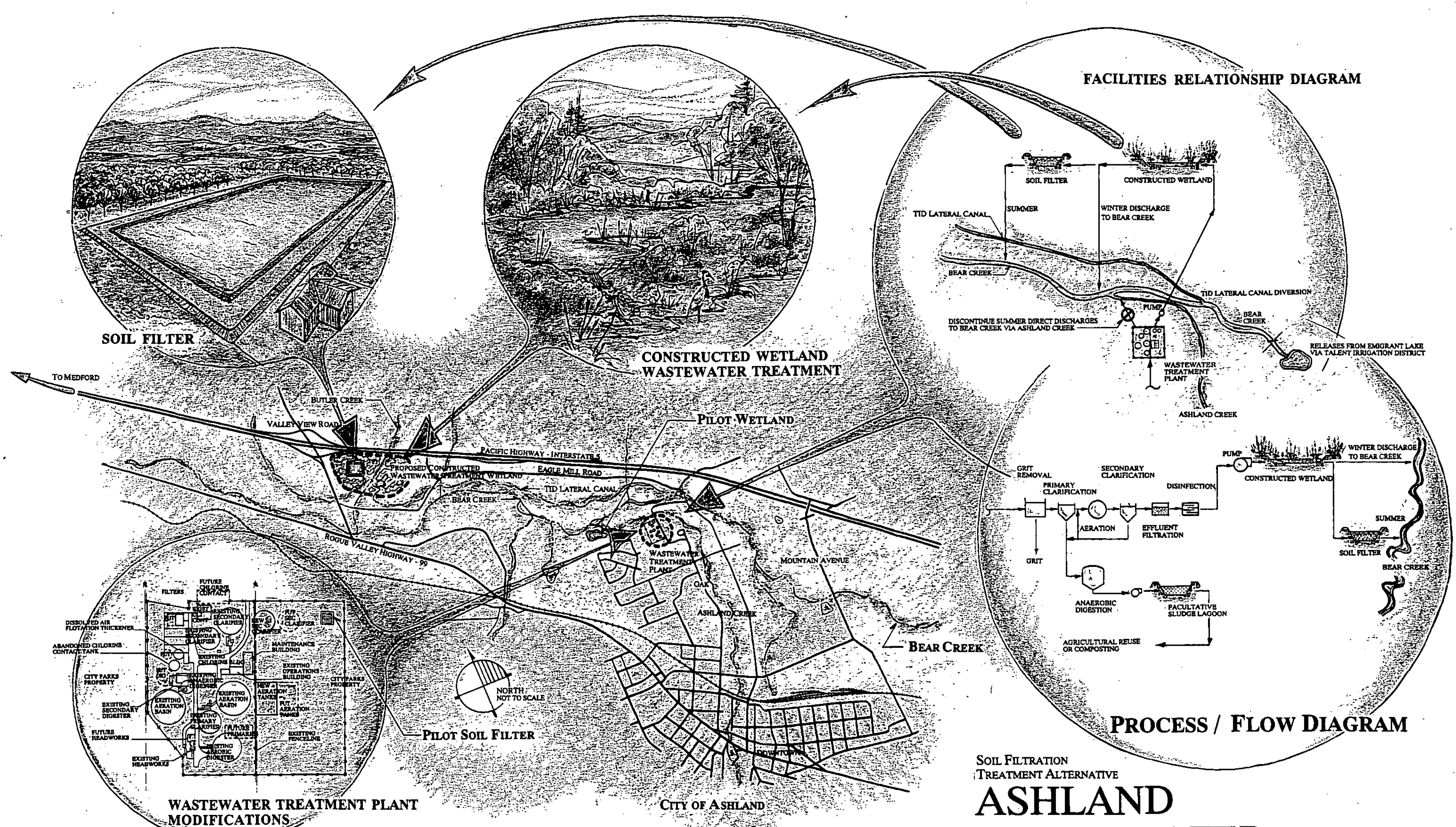
BROWN & CALDWELL

CITY OF ASHLAND AND
TALENT IRRIGATION DISTRICT
EFFLUENT REUSE ALTERNATIVES

ASHLAND WASTEWATER FACILITIES PLAN

CITY OF ASHLAND, OREGON ••• JANUARY 17, 1995

2.



SOIL FILTRATION
TREATMENT ALTERNATIVE

ASHLAND WASTEWATER FACILITIES PLAN 3.

CITY OF ASHLAND, OREGON • • • FEBRUARY 13, 1995

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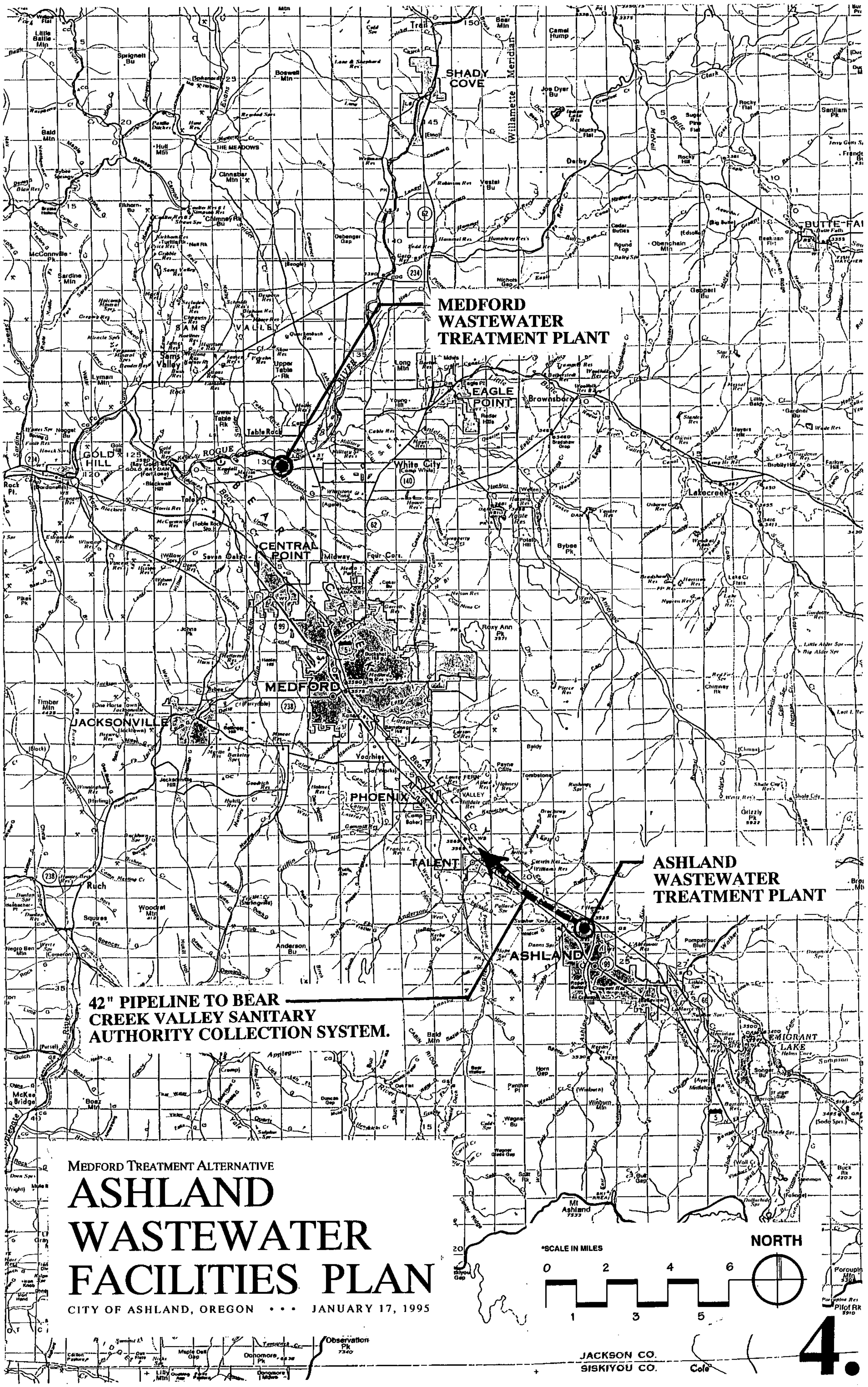
BROWN & CALDWELL



MEDFORD TREATMENT ALTERNATIVE

ASHLAND WASTEWATER FACILITIES PLAN

CITY OF ASHLAND, OREGON • • • JANUARY 17, 1995

4.

Medford Treatment Alternative Costs
1/13/95

Item	Cost (a), $1,000
Demolish existing plant	240
Conveyance to Medford	5,790
Medford WWTP SDC (b)	5,540
BCVSA SDC	4,939
Subtotal	16,510
Contractor indirects (g)	784
Subtotal	17,294
Contingency (c)	2,227
Subtotal	19,521
Engineering, administration (d)	2,260
Total capital cost	21,782
Annual operating costs (b,h)	815
Present worth of operating costs (e)	11,076
Salvage value (f)	(3,944)
Present worth of salvage (e)	(1,800)
Total present worth	31,058

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Costs based on information received from City of Medford on 1/11/95.
(c) Calculated at 25% of construction costs and 5% of SDC costs.
(d) Calculated at 25% of construction costs and contingency.
(e) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(f) Assumes linear depreciation.
(g) Estimated at 13% of construction costs.
(h) Includes cost for replacement water for Bear Creek per TID.

Talent Irrigation District Alternative Costs
1/13/95

Item	Cost (a), 1,000
Grit removal	15
Primary clarifier	71
Aeration basins, existing	256
Aeration basins, new	956
Blowers (including building)	549
Secondary clarifier No. 1	195
Secondary clarifier No. 2	12
Secondary clarifier No. 3	566
Disinfection	256
Chlorine scrubbing	183
Chemical feed/flocculation	364
Tertiary filter	519
Effluent storage (d)	1,460
Anaerobic digester No. 2	592
Digester control building	842
Demolish secondary digester	146
Sludge thickener	275
Facultative sludge lagoon (b)	1,073
Sludge transport	320
Subtotal	8,650
Electrical/instrumentation (h)	1,730
Yard piping (h)	1,730
Contractor indirect costs (i)	1,124
Subtotal	13,234
Wetlands (c)	3,941
Subtotal	17,175
Contingency at 25%	4,294
Subtotal	21,468
Engineering/administration at 25%	5,367
Subtotal	26,835
Land (e)	171
Total capital cost	27,006
Annual operating costs (j)	1,033
Present worth of operating costs (f)	14,039
Salvage value (g)	(5,306)
Present worth of salvage (f)	(2,422)
Total present worth	38,623

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Includes sludge force main and pumping station.
(c) Cost taken from Woodward-Clyde Facilities Plan Addendum.
(d) Pond would provide 30 day's worth of effluent storage.
(e) Assumes purchase of Butler Creek site.
(f) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(g) Assumes linear depreciation.
(h) Estimated at 20% of subtotal.
(i) Estimated at 13% of subtotal.
(j) Includes cost for replacement water for Bear Creek per TID.

City Land Effluent Reuse Alternative Costs
1/13/95

Item	Cost (a), 1,000
Grit removal	15
Primary clarifier	71
Aeration basins, existing	256
Aeration basins, new	956
Blowers (including building)	549
Secondary clarifier No. 1	195
Secondary clarifier No. 2	12
Secondary clarifier No. 3	566
Disinfection	256
Chlorine scrubbing	183
Tertiary filter	348
Irrigation pumping stations	288
Effluent storage/irrigation system (d)	2,618
Anaerobic digester No. 2	592
Digester control building	842
Demolish secondary digester	146
Sludge thickener.	275
Facultative sludge lagoon (b)	1,073
Sludge transport	320
Subtotal	9,561
Electrical/instrumentation (h)	1,912
Yard piping (h)	1,912
Contractor indirect costs (i)	1,243
Subtotal	14,628
Wetlands (c)	355
Subtotal	14,983
Contingency at 25%	3,746
Subtotal	18,729
Engineering/administration at 25%	4,682
Subtotal	23,411
Land (e)	1,098
Total capital cost	24,509
Annual operating costs (j)	1,039
Present worth of operating costs (f)	14,120
Salvage value (g)	(5,054)
Present worth of salvage (f)	(2,307)
Total present worth	36,323

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Includes sludge force main and pumping station.
(c) Cost taken from Woodward-Clyde Facilities Plan Addendum.
(d) Pond would provide 30 day's worth of effluent storage.
(e) Assumes purchase of 700 acres for irrigation.
(f) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(g) Assumes linear depreciation.
(h) Estimated at 20% of subtotal.
(i) Estimated at 13% of subtotal.
(j) Includes cost for replacement water for Bear Creek per TID.

Advanced Wastewater Treatment Costs
2/2/95

Item	Cost (a), $1,000
Grit removal	15
Bar screens, headworks	260
Primary clarifier, existing	71
Primary clarifier, new	327
Alum mixing and feed	196
Aeration tanks, existing	256
Aeration tanks, new	956
Recycle pumping	100
Blowers (including building)	549
Secondary clarifier no.1	317
Secondary clarifier no. 2	733
Tertiary clarifiers	3,599
Tertiary filter	521
Disinfection	349
Chlorine scrubbing	183
Chlorine contact	37
Anaerobic digester 2	599
Digester control building	910
Demolish secondary digester	146
Gravity thickeners	625
Sludge thickener	1,103
Facultative sludge lagoon (b)	1,148
Sludge transport	320
Operations building	473
Subtotal	13,793
Electrical/instrumentation (e)	2,759
Yard piping (e)	2,759
Contractor indirects/mobilization (f)	1,793
Subtotal	21,104
Contingency at 25%	5,276
Subtotal	26,380
Engineering, administration at 25%	6,595
Soil filter pilot study	80
Total capital cost	33,055
Annual operating costs	1,231
Present worth of operating costs (c)	16,729
Salvage value (d)	(3,587)
Present worth of salvage (c)	(1,637)
Total present worth	48,147

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Includes sludge force main and pumping station.
(c) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(d) Assumes linear depreciation.
(e) Estimated at 20% of subtotal.
(f) Estimated at 13% of subtotal.

Soil Filter with Wetlands Alternative Costs
2/7/95

Item	Cost (a), 1,000
Grit removal	15
Primary clarifier	71
Aeration basins, existing	256
Aeration basins, new	956
Blowers (including building)	549
Secondary clarifier No. 1	195
Secondary clarifier No. 2	12
Secondary clarifier No. 3	566
Disinfection	256
Chlorine scrubbing	183
Tertiary filter	348
Anaerobic digester No. 2	592
Digester control building	842
Demolish secondary digester	146
Sludge thickener.	275
Facultative sludge lagoon (b)	1,073
Sludge transport	320
Subtotal	6,655
Electrical/instrumentation (g)	1,331
Yard piping (g)	1,331
Contractor indirect costs (h)	865
Subtotal	10,182
Soil filter	1,513
Experimental wetlands	355
Wetlands (c)	3,941
Subtotal	15,990
Contingency at 25%	3,998
Subtotal	19,988
Engineering/administration at 25%	4,997
Subtotal	24,985
Land (d)	221
Soil filter pilot study	80
Total capital cost	25,286
Annual operating costs (c)	1,090
Present worth of operating costs (e)	14,813
Salvage value (f)	(4,563)
Present worth of salvage (e)	(2,082)
Total present worth	38,017

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Includes sludge force main and pumping station.
(c) Cost based on Woodward-Clyde Facilities Plan Addendum. Assumes 6-acre soil filter and $180,000/year soil replacement cost.
(d) Includes land costs for wetlands and soil filter.
(e) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(f) Assumes linear depreciation.
(g) Estimated at 20% of subtotal.
(h) Estimated at 13% of subtotal.

Soil Filter Alternative Costs
2/7/95

Item	Cost (a), 1,000
Grit removal	15
Primary clarifier	71
Aeration basins, existing	256
Aeration basins, new	956
Blowers (including building)	549
Secondary clarifier No. 1	195
Secondary clarifier No. 2	12
Secondary clarifier No. 3	566
Disinfection	256
Chlorine scrubbing	183
Tertiary filter	348
Anaerobic digester No. 2	592
Digester control building	842
Demolish secondary digester	146
Sludge thickener.	275
Facultative sludge lagoon (b)	1,073
Sludge transport	320
Subtotal	6,655
Electrical/instrumentation (g)	1,331
Yard piping (g)	1,331
Contractor indirect costs (h)	865
Subtotal	10,182
Soil filter (c)	1,513
Wetlands	355
Subtotal	12,050
Contingency at 25%	3,012
Subtotal	15,062
Engineering/administration at 25%	3,766
Subtotal	18,828
Land (d)	50
Soil filter pilot study	80
Total capital cost	18,958
Annual operating costs (c)	1,160
Present worth of operating costs (e)	15,765
Salvage value (f)	(2,850)
Present worth of salvage (e)	(1,301)
Total present worth	33,422

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Includes sludge force main and pumping station.
(c) Cost based on Woodward-Clyde Facilities Plan Addendum. Assumes 5-acre soil filter and $300,000/year soil replacement cost.
(d) Assumes purchase of 10 acres.
(e) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(f) Assumes linear depreciation.
(g) Estimated at 20% of subtotal.
(h) Estimated at 13% of subtotal.

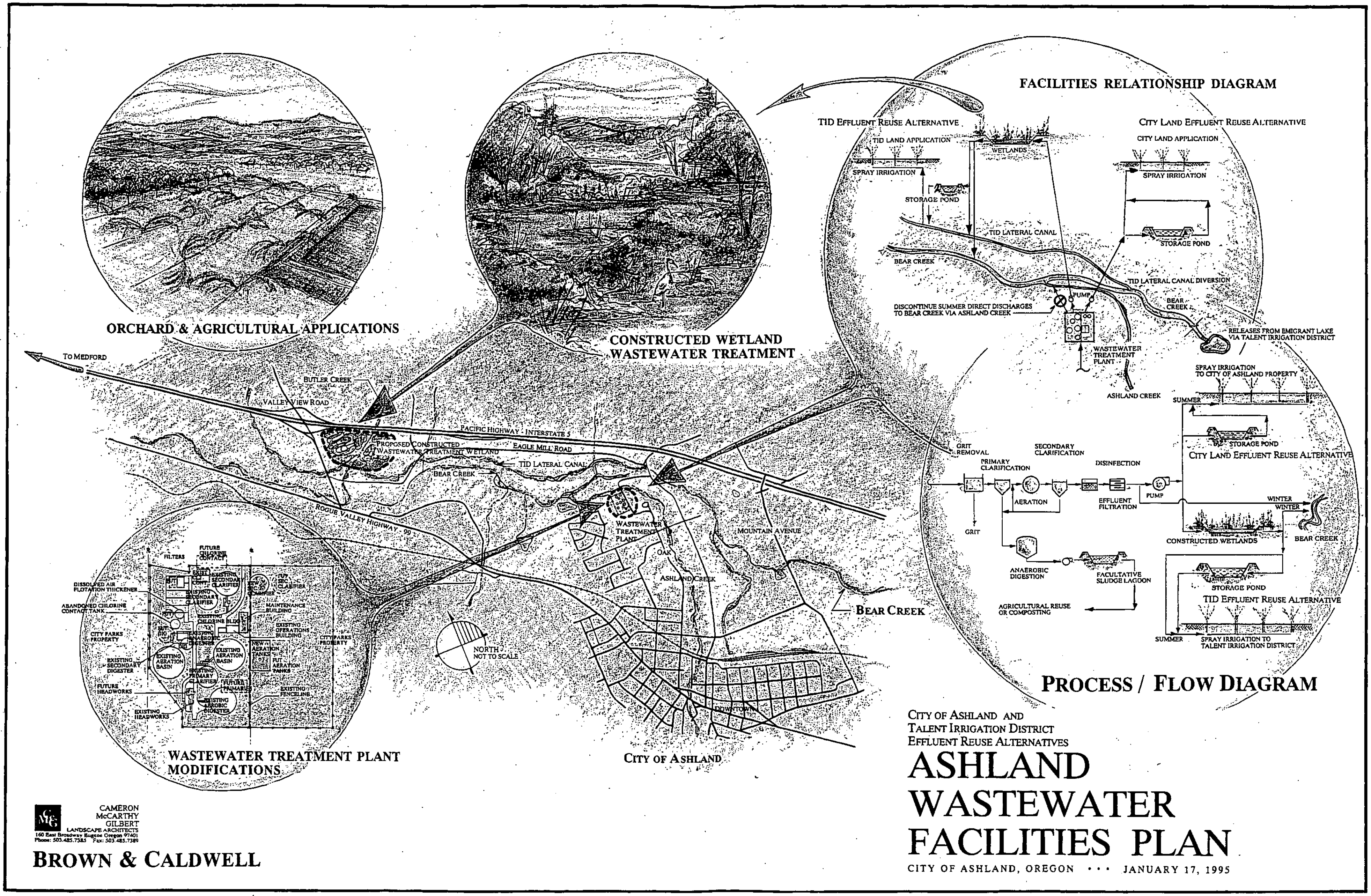
DETAILED COST ESTIMATES

ASHLAND WASTEWATER FACILITIES PLAN

CITY OF ASHLAND, OREGON FEBRUARY 13, 1995

CAMERON McCARTHY GILBERT
LANDSCAPE ARCHITECTS
160 East Broadway Eugene Oregon 97401
Phone: 503.485.7385 Fax: 503.485.7389

BROWN & CALDWELL



ORCHARD & AGRICULTURAL APPLICATIONS
CONSTRUCTED WETLAND WASTEWATER TREATMENT
FACILITIES RELATIONSHIP DIAGRAM
TID EFFLUENT REUSE ALTERNATIVE
TID LAND APPLICATION
SPRAY IRRIGATION
STORAGE POND
WETLANDS
TID LATERAL CANAL
BEAR CREEK
CITY LAND EFFLUENT REUSE ALTERNATIVE
CITY LAND APPLICATION
SPRAY IRRIGATION
STORAGE POND
TID LATERAL CANAL DIVERSION
PUMP
BEAR CREEK
DISCONTINUE SUMMER DIRECT DISCHARGES TO BEAR CREEK VIA ASHLAND CREEK
RELEASES FROM EMIGRANT LAKE VIA TALENT IRRIGATION DISTRICT
WASTEWATER TREATMENT PLANT
ASHLAND CREEK
TO MEDFORD
BUTLER CREEK
VALLEY VIEW ROAD
PACIFIC HIGHWAY - INTERSTATE 5
PROPOSED CONSTRUCTED WASTEWATER TREATMENT WETLAND
EAGLE MILL ROAD
TID LATERAL CANAL
BEAR CREEK
ROGUE VALLEY HIGHWAY - 99
WASTEWATER TREATMENT PLANT
MOUNTAIN AVENUE
OAK
ASHLAND CREEK
BEAR CREEK
NORTH NOT TO SCALE
DOWNTOWN
CITY OF ASHLAND
SPRAY IRRIGATION TO CITY OF ASHLAND PROPERTY
SUMMER
STORAGE POND
CITY LAND EFFLUENT REUSE ALTERNATIVE
GRIT REMOVAL
PRIMARY CLARIFICATION
SECONDARY CLARIFICATION
DISINFECTION
AERATION
EFFLUENT FILTRATION
PUMP
WINTER
WINTER
GRIT
CONSTRUCTED WETLANDS
BEAR CREEK
ANAEROBIC DIGESTION
FACULTATIVE SLUDGE LAGOON
STORAGE POND
TID EFFLUENT REUSE ALTERNATIVE
AGRICULTURAL REUSE OR COMPOSTING
SUMMER
SPRAY IRRIGATION TO TALENT IRRIGATION DISTRICT
PROCESS / FLOW DIAGRAM
FILTERS
FUTURE CHLORINE CONTACT
DISSOLVED AIR FLOTATION THICKENER
ABANDONED CHLORINE CONTACT TANK
EXISTING SECONDARY CLARIFIER
MAINTENANCE BUILDING
EXISTING CHLORINE BLDG
EXISTING OPERATIONS BUILDING
CITY PARKS PROPERTY
EXISTING AERATION BASIN
NEW AERATION TANKS
FUT AERATION TANKS
EXISTING SECONDARY DIGESTER
FUTURE PRIMARIES
EXISTING FENCELINE
FUTURE HEADWORKS
EXISTING ANAEROBIC DIGESTER
EXISTING HEADWORKS
WASTEWATER TREATMENT PLANT MODIFICATIONS
CITY OF ASHLAND AND TALENT IRRIGATION DISTRICT EFFLUENT REUSE ALTERNATIVES
ASHLAND WASTEWATER FACILITIES PLAN
CITY OF ASHLAND, OREGON ••• JANUARY 17, 1995
CAMERON McCARTHY GILBERT LANDSCAPE ARCHITECTS
160 East Broadway Eugene Oregon 97401
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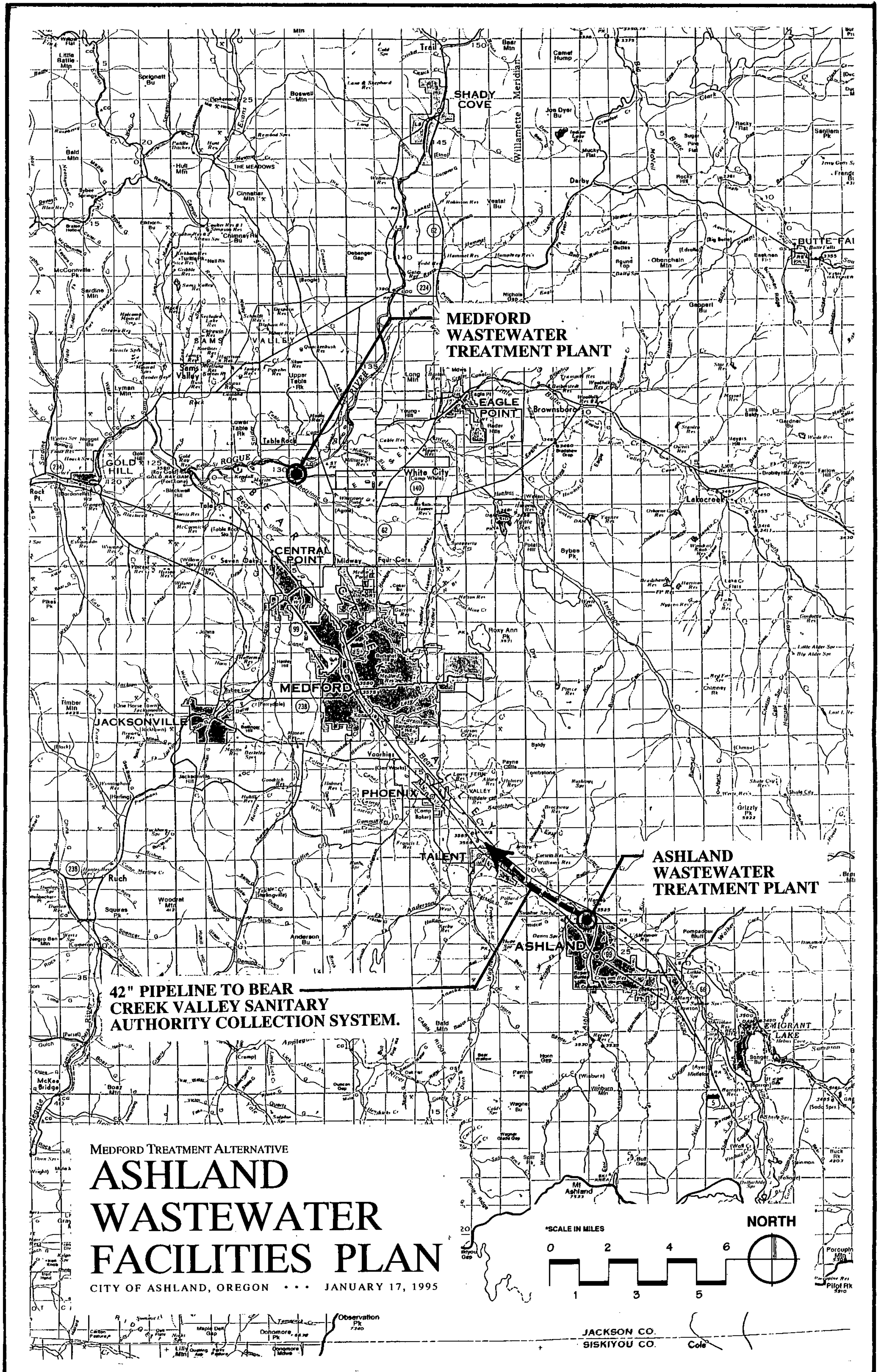
BROWN & CALDWELL



MEDFORD TREATMENT ALTERNATIVE

ASHLAND WASTEWATER FACILITIES PLAN

CITY OF ASHLAND, OREGON • • • JANUARY 17, 1995

CITY OF ASHLAND
WASTEWATER FACILITIES
PLAN UPDATE

JANUARY 17, 1995

COUNCIL SESSION

BROWN AND CALDWELL

City of Ashland Wastewater Facilities Plan
Alternative Cost Comparison
1/13/95

Item	Alternative		
	Convey to Medford	City Land Effluent Reuse	TID Effluent Reuse
Capital cost, $1000	21,782	24,509	27,006
Present worth, $1000	31,058	36,323	38,623

City of Ashland Wastewater Facilities Plan
Medford Treatment Alternative Costs
1/13/95

Item	Cost (a), $1,000
Demolish existing plant	240
Conveyance to Medford	5,790
Medford WWTP SDC (b)	5,540
BCVSA SDC	4,939
Subtotal	16,510
Contractor indirects (g)	784
Subtotal	17,294
Contingency (c)	2,227
Subtotal	19,521
Engineering, administration (d)	2,260
Total capital cost	21,782
Annual operating costs (b,h)	815
Present worth of operating costs (e)	11,076
Salvage value (f)	(3,944)
Present worth of salvage (e)	(1,800)
Total present worth	31,058

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Costs based on information received from City of Medford on 1/11/95.
(c) Calculated at 25% of construction costs and 5% of SDC costs.
(d) Calculated at 25% of construction costs and contingency.
(e) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(f) Assumes linear depreciation.
(g) Estimated at 13% of construction costs.
(h) Includes cost for replacement water for Bear Creek per TID.

City of Ashland Wastewater Facilities Plan
City Land Effluent Reuse Alternative Costs
1/13/95

Item	Cost (a), 1,000
Grit removal	15
Primary clarifier	71
Aeration basins, existing	256
Aeration basins, new	956
Blowers (including building)	549
Secondary clarifier No. 1	195
Secondary clarifier No. 2	12
Secondary clarifier No. 3	566
Disinfection	256
Chlorine scrubbing	183
Tertiary filter	348
Irrigation pumping stations	288
Effluent storage/irrigation system (d)	2,618
Anaerobic digester No. 2	592
Digester control building	842
Demolish secondary digester	146
Sludge thickener.	275
Facultative sludge lagoon (b)	1,073
Sludge transport	320
Subtotal	9,561
Electrical/instrumentation (h)	1,912
Yard piping (h)	1,912
Contractor indirect costs (i)	1,243
Subtotal	14,628
Wetlands (c)	355
Subtotal	14,983
Contingency at 25%	3,746
Subtotal	18,729
Engineering/administration at 25%	4,682
Subtotal	23,411
Land (e)	1,098
Total capital cost	24,509
Annual operating costs (j)	1,039
Present worth of operating costs (f)	14,120
Salvage value (g)	(5,054)
Present worth of salvage (f)	(2,307)
Total present worth	36,323

Notes:

(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Includes sludge force main and pumping station.
(c) Cost taken from Woodward-Clyde Facilities Plan Addendum.
(d) Pond would provide 30 day's worth of effluent storage.
(e) Assumes purchase of 700 acres for irrigation.
(f) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(g) Assumes linear depreciation.
(h) Estimated at 20% of subtotal.
(i) Estimated at 13% of subtotal.
(j) Includes cost for replacement water for Bear Creek per TID.

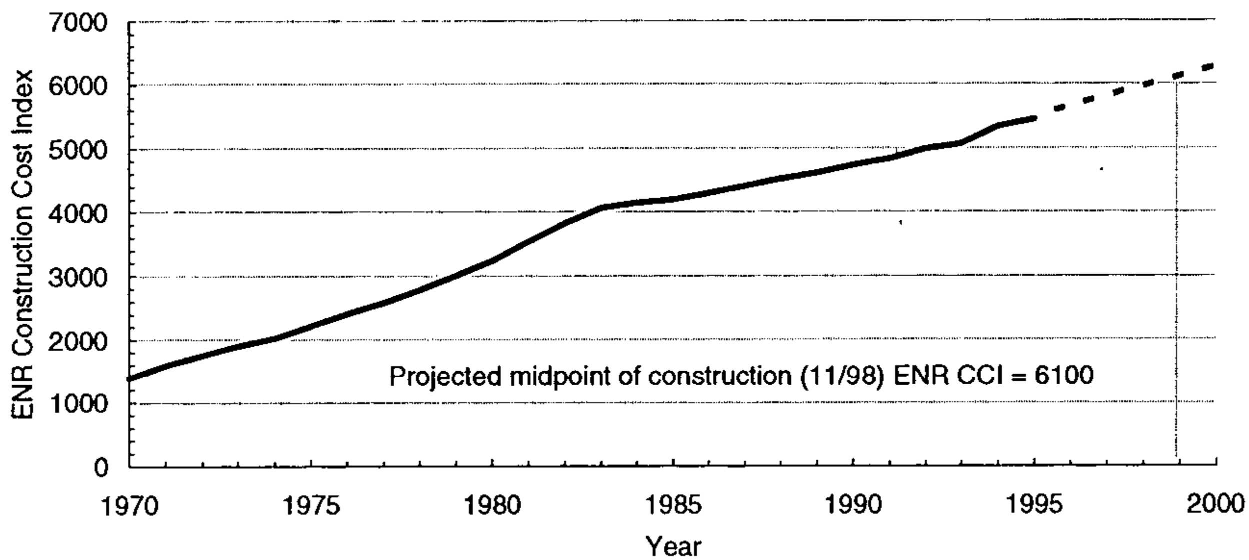
City of Ashland Wastewater Facilities Plan
Talent Irrigation District Alternative Costs
1/13/95

Item	Cost (a), 1,000
Grit removal	15
Primary clarifier	71
Aeration basins, existing	256
Aeration basins, new	956
Blowers (including building)	549
Secondary clarifier No. 1	195
Secondary clarifier No. 2	12
Secondary clarifier No. 3	566
Disinfection	256
Chlorine scrubbing	183
Chemical feed/flocculation	364
Tertiary filter	519
Effluent storage (d)	1,460
Anaerobic digester No. 2	592
Digester control building	842
Demolish secondary digester	146
Sludge thickener	275
Facultative sludge lagoon (b)	1,073
Sludge transport	320
Subtotal	8,650
Electrical/instrumentation (h)	1,730
Yard piping (h)	1,730
Contractor indirect costs (i)	1,124
Subtotal	13,234
Wetlands (c)	3,941
Subtotal	17,175
Contingency at 25%	4,294
Subtotal	21,468
Engineering/administration at 25%	5,367
Subtotal	26,835
Land (e)	171
Total capital cost	27,006
Annual operating costs (j)	1,033
Present worth of operating costs (f)	14,039
Salvage value (g)	(5,306)
Present worth of salvage (f)	(2,422)
Total present worth	38,623

Notes:

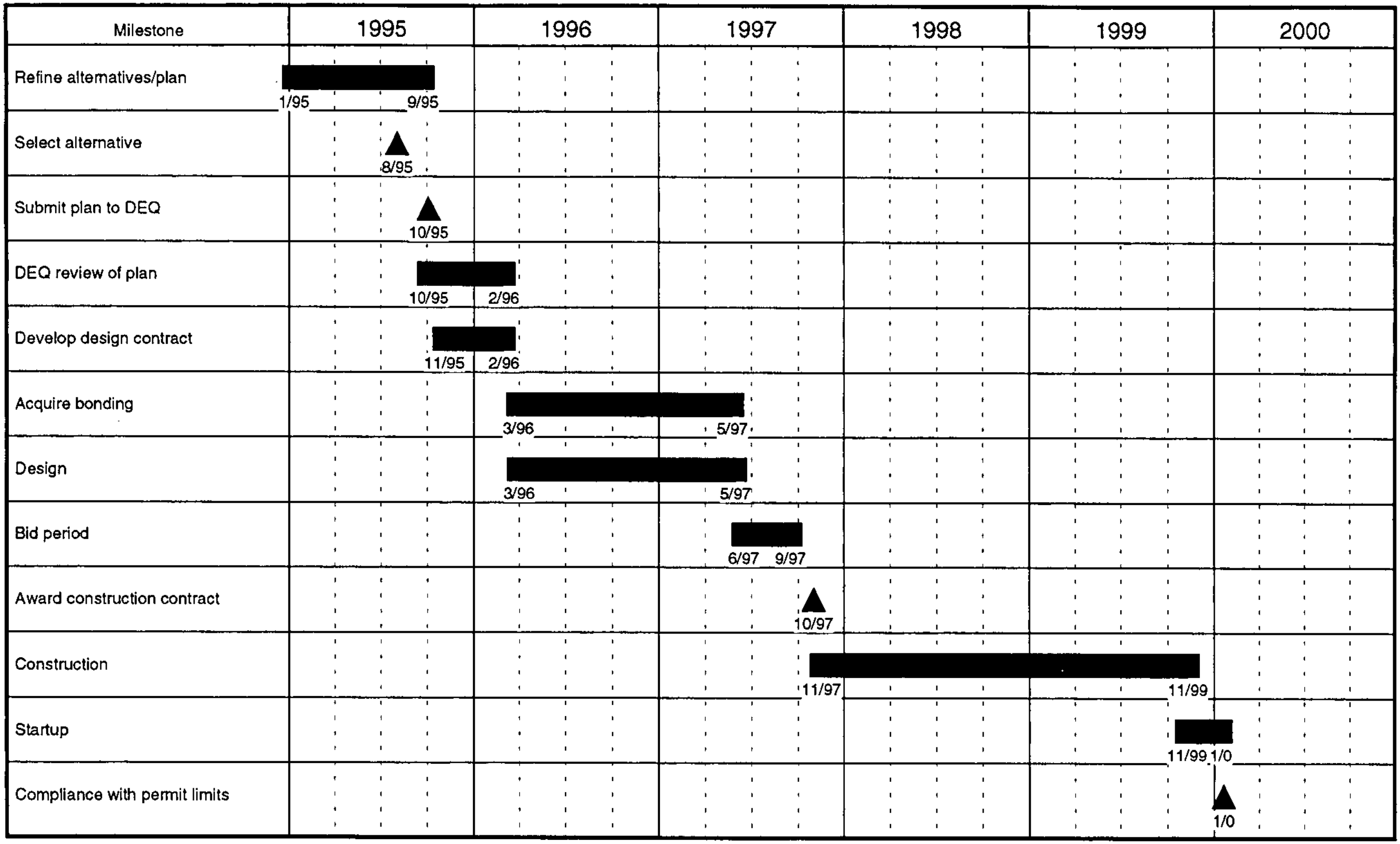
(a) Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
(b) Includes sludge force main and pumping station.
(c) Cost taken from Woodward-Clyde Facilities Plan Addendum.
(d) Pond would provide 30 day's worth of effluent storage.
(e) Assumes purchase of Butler Creek site.
(f) Present worth calculated assuming a discount rate of 4% and a 20-year study period.
(g) Assumes linear depreciation.
(h) Estimated at 20% of subtotal.
(i) Estimated at 13% of subtotal.
(j) Includes cost for replacement water for Bear Creek per TID.

Engineering News-Record Construction Cost Index



Ashland Wastewater Treatment - Project Schedule

1/16/1995



CULTURAL SOLUTIONS
P.O. Box 401 • Ashland, Or 97520
phone / fax: 503 / 482-8004

February 21, 1995

TO: Mayor, Council

FROM: Rob Winthrop

SUBJ: Don's WWTP memo

Don did an admirable job in drafting the background paper. There are some changes needed, however, in addition to those suggested by Mr. Hall (phosphorous, not nitrogen; breakout capital costs and operating estimates) and some spell-checking (dilute, not dillute, etc.).

(1) Tables. The material would be clearer with some information presented through tables. I suggest (a) a table summarizing current discharge conditions by pollutant and new standards; (b) a ranking of alternatives by capital outlay; and (c) a ranking of alternatives by complexity/uncertainty.

(2) The Medford Option costs. I think that Brian and Steve would agree with me in saying that the estimates of SDCs (particularly the BCVSA SDC, listed at $4.9 million) are probably unrealistically high. We may well decide to reject the Medford option, but let's do so from a clear sense of the tradeoffs. As council liason for this project for the past two years, I believe that a range of $19 - $22 million more accurately portrays the capital costs of the Medford option, given the pricing assumptions in the current B&C estimates.

(3) Text changes. Please consider the following changes to Don's text.

At ¶4. Insert new subhead: DEFINING ALTERNATIVES.

Replace ¶4 with following. The first decision facing the council concerns whether to abandon our plant altogether by constructing a pipeline to carry sewage to the existing Medford Regional WWTP (wastewater treatment plant)—the "Medford alternative"—or to operate the Ashland WWTP within the new regulations—the "Ashland alternatives." (See Table ___).

The study of alternative treatment methods demonstrated that major engineering improvements to Ashland's existing WWTP (construction costs $16 million) would be required under all Ashland alternatives under consideration. Wetlands by themselves were technically too uncertain to meet the new regulations. It may, however, be feasible to meet regulations by combining treatment plant modifications with a relatively new technique of trapping phosphates through a soil filter. This would be one of the least expensive solutions in terms of construction costs. If soil filtration and wetland techniques can be combined, the project would have higher construction costs and somewhat lower operating costs than with soil filtration alone.

Page 2, ¶2 (re reuse): add to existing text. Alternatively, the City of Medford is considering reusing the Medford plant effluent by returning it to the regional irrigation system, which could permit additional water to be released into Bear Creek from Emigrant Lake.

Page 3: Summary of advantages... Replace or correct as noted.

1. Medford Alternative ($19 - $22 million; $.8 million annual operating cost). The advantages of this alternative are a relatively certain construction cost, no more involvement of Ashland in the sewage treatment business, an economy of scale in participating in the regional system, and no more chance of sewage treatment-related odor. The disadvantage is the any future local use of the effluent would be lost, though it might be reused on a regional basis. Consideration of the Medford alternative would be contingent on Ashland becoming a member of the Regional Rate Committee, which determines all rates for the regional facility. The standards for the Medford plant may also be raised in the near future. While an estimate of the costs of upgrading the regional facility have been included in our costs estimates for the Medford Alternative, these figures remain uncertain.

2. T.I.D Alternative ($27 million; $1 million annual operating cost).

3. City Land Alternative ($24.5 million; $1 million annual operating cost). On line 3, change "would probably" to "might."

4. Earth Filtration Alternative ($19 - $25 million; $1.1 million annual operating cost). Line 4, replace "it would be the cheapest alternative at about $27 million" with "it would be one of the cheaper alternatives."

[city\wwtp9501.wp]

Memorandum

February 16, 1995

To: Brian Almquist, City Administrator

From: Steven Hall, Public Works Director

Subject: **Wastewater Plant Information Update**

ACTION REQUESTED

City Council:

1. Accept/modify Don Laws Background Paper

2. Accept/modify Brown and Caldwell Information Packet

3. Set process/time frames for public involvement process

4. Decide on a formal public hearing before the Council. Should this be during a normal Council meeting or a separate special meeting?

BACKGROUND

DON LAWS BACKGROUND PAPER

At the last City Council meeting, Don Laws submitted a Background Paper and a recommendation that the paper be used as a springboard for seeking public comment. I have a few suggested changes that I have discussed with Don.

1. The cost figures listed in the paper are for net present worth and I am not sure that the public would understand the meaning of that figure. I would recommend that the construction and annual operational costs be listed separately.

2. Page 2, Decision No. 2, 5th line refers to "nitrogen" which should be "phosphorous".

BROWN AND CALDWELL INFORMATION

At the January 17, 1995 Council meeting, John Holroyd presented graphics and summaries of the options for Council consideration. The Council asked that the option for year around discharge be added and that a decision tree be developed. Attached is the latest update from John Holroyd. Personally, I am quite pleased with the results and have reviewed them with Rob Winthrop.

SUGGESTED PROCESS

In order to reach as many individuals and businesses in Ashland as possible, I am suggesting the following process for Council.

1. Send Don's paper via bulk mail to all residents and businesses in Ashland. In addition, have copies available at City Hall, Public Works, the Library, Ashland High School and Southern Oregon State College.

2. Submit the letter to the Ashland Daily Tidings and Medford Mail Tribune for publication as a guest editorial.

3. Set two "informal" hearings meetings for the public to "drop in", look at the visuals and ask questions. Don Laws letter would be available and written comments would be encouraged by the attendees. Meetings would be held between 4 and 8 p.m. on two days selected by Council. John Gasik and Gary Arnold from DEQ, John Holroyd from Brown and Caldwell and myself will be present at the meetings. Would the Council wish a representative be present at the meetings?

4. City Council conduct a formal public hearing approximately one month after the informal hearings. This would allow staff the time to assemble the information received from the public and present to the Council a week prior to the public hearing.

cc: John Holroyd, P.E., Brown and Caldwell
Jonathan Gasik, P.E., Medford DEQ
Gary Arnold, Medford DEQ
Dennis Barnts, Water Quality Superintendent
Gary Schrodt, Ashland Wetland Coalition
Nancy Abelle, Ashland Clean Air Coalition
Klaas Van de Pol, League of Women Voters

Enc: Laws Background Paper
Holroyd letter 2/14/95
Holroyd Information Packet

DRAFT

COUNCIL: What changes need to be made in this draft before it is published in the newspaper?
Don L.

WASTEWATER DECISIONS: A BACKGROUND PAPER FOR INTERESTED CITIZENS

BACKGROUND

The nation's Clean Water Act requires that all streams, rivers, and lakes in the United States must be made fishable and swimable. In 1977 a study of Bear Creek determined that the creek contained a number of pollutants that were harmful to fish and must be cleaned up. That study identified the Ashland sewage treatment plant as a major source of those pollutants and recommended that the treatment process be improved. At that time the Oregon Department of Environmental Quality, which is responsible for enforcing the Clean Water Act in our state, said it was the Department's policy that "upgrading to more stringent requirements will be deferred until it is necessary to expand or otherwise modify or replace the existing treatment facilities."

A few years later a private environmental organization sued the D.E.Q., claiming that it was not enforcing the federal law requiring timely cleanup of Bear Creek and several other similar streams around the state. The judge agreed and ordered the D.E.Q. to require the appropriate polluters to begin reducing their pollutants. Ashland was notifed that it would have to reduce pollutants from sewage treatment to certain specified levels, and should immediately determine how it could do so. The city hired an engineering firm, which offered several alternatives for reaching those levels. Unfortunately, because the flow of water in Bear Creek is so low during parts of the year, there is little water to dilute the polluted water coming from the treatment plant, so the levels of pollutants that were allowed for Ashland were among the lowest anywhere in the nation. Consequently, the alternatives presented by the engineering firm were very costly. The Council was also concerned because all but one extremely expensive and still experimental alternative required that the effluent from the treatment plant be removed from Bear Creek completely during part of the year. The Council pointed out that the water left in the creek at those times would be so low that fish could not survive. It presented a real dilemma: polluted water or no water; either solution was bad for fish.

Ashland asked that the state fish and wildlife experts be consulted to see if effluent that was not quite as clean as D.E.Q. required would be better than no water at all. In the meantime, a number of Ashland-area people became interested in wetlands--ponds of water with plants that would naturally remove pollutants--and wondered if they could meet the D.E.Q. standards. The group did some initial research indicating that wetlands at least had a possiblity of working, so the city council requested an extension of time from D.E.Q. to hire more experts to determine if wetlands would work.

The result of that study was that wetlands by themselves were too "iffy" in meeting such strict pollutant requirements, but, if they were combined with treatment plant modifications and a process of filtering the effluent through the earth, they might be able to work. The cost of earth filtration promised to be much cheaper than the alternatives.

In the meantime, it had been determined that the removal of water from Bear Creek probably could be offset by purchasing rights to other water that could be used to replace Ashland's treatment plant effluent. The cost of the various alternatives, including replacement water and operating expenses, would run from $31 million to $38 million. If earth filtration could remove enough nitrogen from the effluent to meet the nitrogen standard, the cost could possibly be reduced to $27 million. Earth filtration would need to be tried with the type of earth availble to Ashland to determine if it could meet the standards.

Additionally, the recent droughts have made local people more aware of the importance of water as a resource. If the drought continues for a number of years, or after a few more decades of growth, Ashland will need more water, and the best source may be treated sewage effluent.

Faced with fines up to $10,000 a day for further delay, the city has signed an agreement with D.E.Q. to provide them with a preferred alternative by August ,1995, and an engineering plan by October, 1995. The Council must, therefore, make some decisions immediately.

DECISION NO. 1

One alternative that would eliminate all pollution of Bear Creek from the Ashland treatment plant would be to pipe our sewage to the Medford treatment plant and buy rights to replacement water for the creek. This would cost about $31 million. It would also result in the loss of the effluent water to Ashland forever. If this alternative is chosen, no further major decisions are necessary.

DECISION NO. 2

If Ashland chooses to hold on to its effluent water, it must decide whether to agree to one of two proven alternatives that would cost $36-38 million, or to do a pilot study on earth filtration that, if successful, would end up providing a system that might cost as little as $27 million. All three alternatives would require the same changes in the treatment plant to remove all pollutants except nitrogen. One would further require treating the water and discharging it to the Talent Irrigation District canal for use as irrigation water. The second would require somewhat less additional treatment and would then be use the water to irrigate land purchased by the city. The earth filtration alternative would require ponds from which the effluent would be filtered in a controlled manner and discharged back into Bear Creek. The first two alternatives would require replacement water for Bear Creek; earth filtration would not.

These alternatives all require major improvements to the Ashland treatment plant and would continue to involve the city in the treatment process. The earth filtration alternative would require a pilot study to determine if available earth will adequately do the job. If the pilot study fails, it would be necessary to go to one of the other alternatives and the additional expense of the study would have been incurred

SUMMARY OF ADVANTAGES AND DISADVANTAGES

1. Medford Alternative. The advantages of this alternative are a relatively certain cost of no more than $36 million, no more involvement of Ashland in the sewage treatment function, and no more chance of sewage treatment-related odor. The disadvantages are that any future use of the effluent water would be lost, and the city would have only a minor say in setting future rates. The standards for the Medford treatment plant may also be raised in the near future, forcing increased rates for all users.

2. T.I.D. Alternative. The advantages of this alternative are a relatively certain cost of $38 million, all D.E.Q. standards would be met, and Ashland would retain the effluent water for future uses. T.I.D. would trade water in its resevoirs for the water it received, so there would be replacement water for Bear Creek. The disadvantages are that it requires sensitive negotiations with T.I.D. and the federal Bureau of Reclamation, the outcome of which are not guaranteed, and it costs more than other alternatives.

3. City Land Alternative. The advantages of this alternative are a relatively certain cost of $36 million, all D.E.Q. standards would be met, and Ashland would retain the effluent water for future uses. The land purchased for irrigation with the effluent would probably have water rights that could be used to acquire replacement water for Bear Creek. The disadvantages are that the outcome of negotiations to allow the water rights to be used as replacement water are not guaranteed, and the cost would be greater than other alternatives.

4. Earth Filtration Alternative. The advantages of this alternative are that the effluent water would return directly to Bear Creek and no replacement water would have to be acquired, the water would be available for possible future uses, and if the pilot study shows the system will work, it would be the cheapest alternative at about $27 million. The disadvantages are that the pilot study will cost money and may show the method will not work, and the exact cost of earth filtration is much less certain than the other alternatives.

YOUR OPINION WOULD BE APPRECIATED

The Council must make its decision soon. If you have an opinion, write, call, or talk to us. This is not an easy problem, and there are no obviously correct answers. We have already chosen not to fight the federal law itself or the standards established by the D.E.Q., so the help we need is about what option would be best to meet this mandate.

THE ASHLAND CITY COUNCIL

Memorandum

September 15, 1995

To: Mayor and Members of the City Council

From: Paula C. Brown, Wastewater Treatment Plant Coordinator

Subject: WASTEWATER TREATMENT PLANT - FACILITIES PLAN

Background

In accordance with the Department of Environmental Quality's Mutual Agreement and Order dated February 6, 1995, the City of Ashland must complete and submit a final Facilities Plan by October 1, 1995.

The City has been developing the Facilities Plan for the past several years. Recent City Council action and decision to retain the wastewater treatment plant effluent, discharge to Bear Creek in the Winter, spray irrigate on City lands in the Summer, and evaluate a wetlands system for potential treatment benefits, is the basis for the final Facilities Plan that will be submitted to the DEQ.

Attached are two draft chapters; Chapter 2, Executive Summary, and Chapter 10, Recommended Plan, of the final Facilities Plan that outline and describe the Council's decision.

The remaining chapters provide background on the plant itself, the process to identify a solution, the permit requirements, and other background information. Most of this information has been reviewed by the City Council in previous sessions, and is being updated with the most recent information available for the final Facilities Plan.

Recommendation

It is requested that the City Council approve the attached draft chapters and recommend staff proceed with completion of the final Facilities Plan and submit the final Plan to DEQ by October 1, 1995.

The enclosure was provided to the Mayor, City Council, City Administrator, and Public Works Director. Please contact me if you have any questions prior to the meeting.

Memorandum

September 15, 1995

To: Mayor and City Council Members

From: Paula C. Brown, Wastewater Treatment Plant Coordinator

Subject: ADDITIONAL INFORMATION - WASTEWATER TREATMENT PLANT

During the September 5, 1995 council meeting, I was asked to review and respond to four items:

1. What is required in writing a Request For Proposals (RFP) for the Demonstration / Pilot Wetlands system (time, costs, etc.)?

2. Can we put an RFP out for bid for the Demonstration / Pilot Wetlands while we are evaluating alternative spray irrigation options for City parks use?

3. What are the benefits of wetlands even if they do not meet the goals of the wastewater treatment process (ie; storm water treatment, etc.)?

4. Provide information on the use of spent alum from the water treatment plant and the effects at the wastewater treatment plant in reducing phosphorous levels.

One of the main issues discussed at the City Council meeting centered upon the evaluation period for the Demonstration / Pilot Wetlands system and whether we could fast track the design and establishment periods to gain three full years (seasons) of wetlands evaluation by the end of 1998.

I have prepared a response to each of these questions:

1. **Writing an RFP:** I anticipate writing a "design / build" type of RFP for the Demonstration / Pilot Wetlands system. This will allow the wetlands system to be designed, established, monitored, and evaluated by the same group of wetlands consulting engineers or scientists so the City may receive the full value of the wetlands system. Writing the RFP is not difficult and could be accomplished by staff with a minimal amount of effort and gain appropriate reviews prior to distribution in three to four weeks time.

2. **RFP Timing:** Yes, the RFP can be put out for bid at the same time as staff and the Council are evaluating the spray irrigation alternatives. The RFP can provide 30-90 days for the wetlands consultants to respond, and you can request that the consultants bids to remain firm for up to 6 months. Although 6 months is a long time for a bid to remain constant, it has been done. That would provide plenty of time for staff and the council to review options for alternative spray irrigation possibilities. Depending upon the time of year that the wetlands consultant is able to start design and then actually start the construction and establishment phase, may

impact the timing for a full evaluation period. Ideally, the best time to complete design would be in the Winter for an early Spring construction start. Asking the consultant to keep his bids firm for up to 6 months may increase the cost of the proposal as the consultant may incur risk beyond a "reasonable" time.

3. **Benefits of a wetlands system if the wastewater treatment value is not thoroughly realized:** If the wetlands system does not enable the wastewater treatment plant to reach a phosphorous level of 0.08 mg/l, there are other benefits that will arise from the wetlands. Temperature may be the next major impact on the creek and wetlands because of their natural vegetative cover, will provide a natural cooling. Depending upon the size and depth, the wetlands will offer a temporary holding area for the treatment plant in case of storm flow discharges. In the event that the wetlands fails to meet the treatment plant criteria and is considered a burden to the process, there may be benefits that the wetlands system can realize with treating storm water runoff in the future. Based on the results realized in the wetlands system with the biological treatment of wastes in conjunction with the WWTP itself, there may be a possibility of designing a more efficient plant with somewhat smaller components. This will be evaluated during each of the phased design periods.

4. **Phosphorous reductions at the WWTP:** Alum (aluminum sulfate) is used as a coagulant in the filtering process at the water treatment plant. The alum used at the water plant although exhausted of its capabilities for effective water filtration, is still active enough to allow coagulation at the wastewater treatment plant. Currently, the spent alum is not regulated as it enters the wastewater treatment plant and is therefore entering the WWTP in concentrated doses, not spread over a controlled period of time. The WWTP has realized a measurable lowering of phosphates to between 2.2 to 1.5 mg/l, with an average running at 1.75. There was one occasion when all of the parameters were "perfect" and the phosphorous level dropped to 0.92 mg/l. This was an abnormality when the alum dose was high and all of the treatment plant processes were in perfect balance for the coagulation/flocculation process to produce maximum phosphorous removal. Treatment plant operators and the water treatment plant are currently working to better regulate the alum addition at the WWTP for a better understanding of the average phosphorous removal with the use of the spent alum.

Lastly; can you get three years of testing if you fast track the design / establishment period of the wetlands? I remain concerned with committing to a fast track schedule that will ensure results. Based on the attached schedule, I have reduced the design period to three months which will initiate the construction / establishment phase of the Demonstration Wetlands system in the Spring of 1996. This is as quick as the process can go with a formal RFP process. This will allow plants to be "in the ground" by the summer of 1996. If the plant material is fully matured and all of the soils are correct to allow immediate establishment and growth, then some evaluation of the wetlands treatment process can occur immediately in the summer of 1996. However, I am skeptical that there will be a necessary growth and establishment period for the plant material and that we are even pushing that if we say that only requires one season. As you will recall, most wetlands systems take several years to become effective (5-8 years per the literature search completed by RVCOG staff). My schedule shows one year for the establishment period and two full seasons of evaluation, through the Fall of 1998.

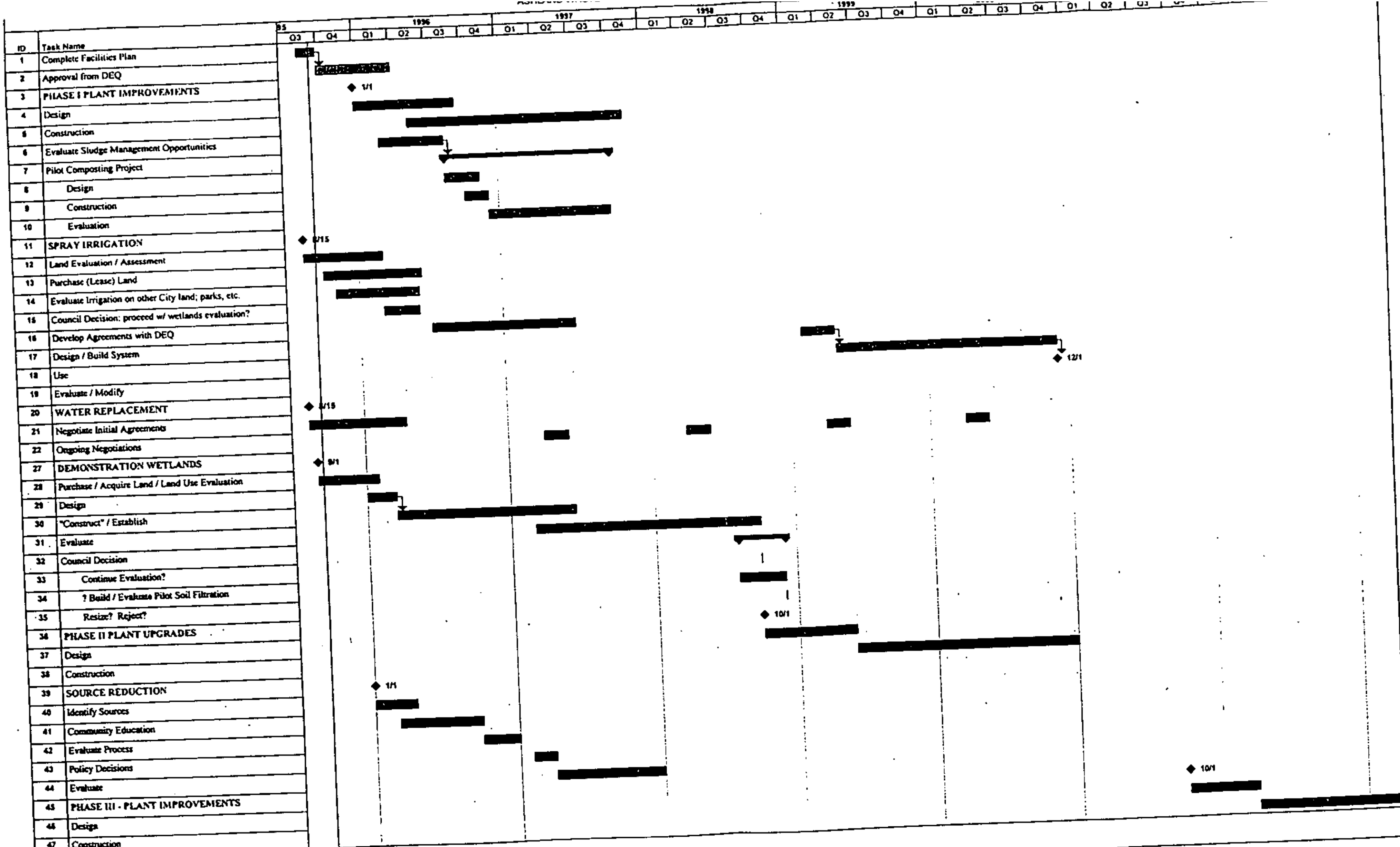
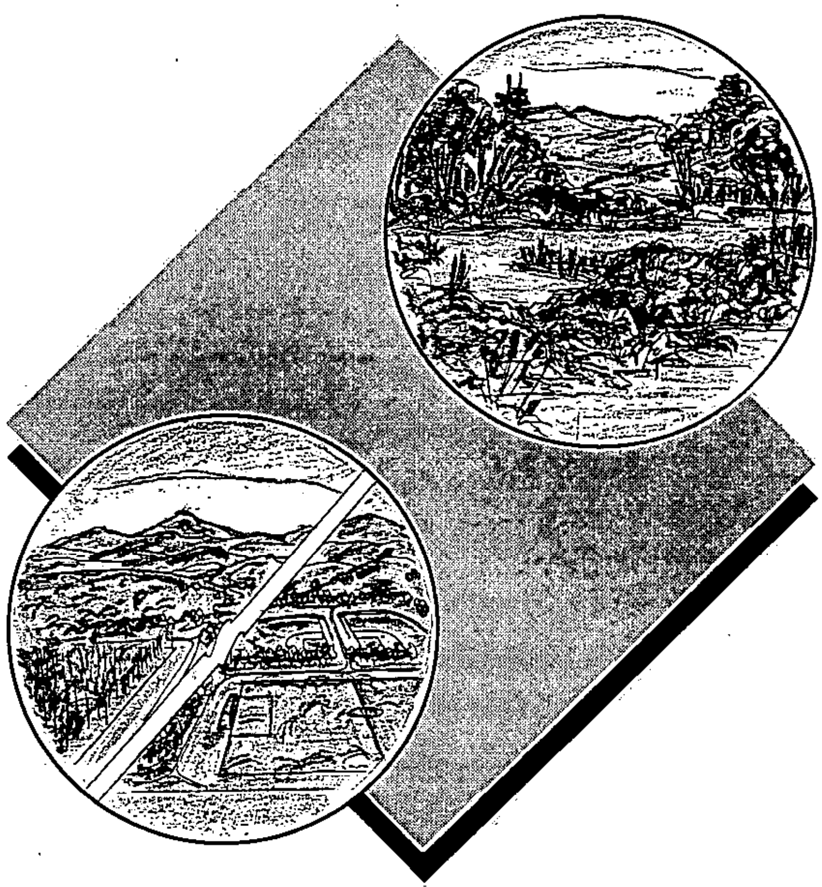


FIGURE 10-5 (Sep 12, 1995)

CITY OF ASHLAND WASTEWATER FACILITIES PLAN

EXECUTIVE SUMMARY
AND
RECOMMENDED PLAN



BY:

THE CITY OF ASHLAND PUBLIC WORKS DEPARTMENT

AND

BROWN & CALDWELL

SEPTEMBER 19, 1995

DRAFT

CHAPTER 2

EXECUTIVE SUMMARY

This facilities plan details the future wastewater treatment needs for the City of Ashland for the next 20-year planning period. The development of planning information is provided first. The plan then presents a wide range of alternatives which were developed over the course of 5 years. These alternatives were then screened to just three options which are explored in detail. A recommended plan, based on the evaluation of cost and non-cost comparisons, is given, followed by a discussion of plan implementation.

CURRENT WASTEWATER TREATMENT SYSTEM

The City of Ashland's existing treatment plant uses a conventional activated sludge process. This process includes primary treatment, secondary treatment, disinfection, and sludge treatment to remove biological solids created during the process. Primary treatment removes the larger, heavier solids by allowing them to settle. Secondary treatment is a biological process that uses bacteria to consume dissolved organic material from the wastewater. Solids are created during the secondary process. The residual solids, known as sludge, then are collected for final processing and disposal. The treated liquid stream, called effluent, is disinfected with chlorine prior to disposal into Ashland Creek about 2,700 feet upstream from its confluence with Bear Creek. Effluent is currently discharged to Ashland Creek year-round. Treated sludge is currently applied to land as a liquid in an agricultural beneficial use program.

The existing plant has limitations in both the amount of wastewater it can treat and the degree of treatment which can be achieved. The last major plant upgrade was undertaken in 1976, and many mechanical components are near the end of their useful life. Most of the major structures are sound and still serviceable.

FUTURE WASTEWATER TREATMENT NEEDS

Future needs for wastewater treatment are determined in part by growth projections for the study area. Growth projections are used to predict future wastewater flows, which, in turn, govern the sizing of treatment processes.

Study Area

The study area encompasses the City of Ashland and its Urban Growth Boundary, approximately 6 square miles. Comprehensive wastewater planning involves consideration of both physical and socioeconomic characteristics within the planning area. Physical elements include climate, topography, and local water resources. Population and growth projections are examples of socioeconomic characteristics.

Climate

The average monthly temperatures vary from approximately 70 degrees F in July to about 40 degrees F in January. Precipitation averages about 19 inches per year while evaporation averages about 44 inches. Precipitation typically influences winter peak wastewater flows, while evaporation is a major factor in sizing effluent irrigation systems.

Topography

Topography within the study area is relatively steep, varying from 15 to 50 percent in the southwest to 5 to 15 degrees to the northeast. These steep slopes restrict the amount of land available for effluent irrigation, sludge application, and the siting of wetlands for wastewater treatment.

Water Resources

The principal water resource in the Ashland planning area is Bear Creek and its tributaries, including Ashland Creek. Bear Creek drains approximately 284 square miles. The 714-acre Emigrant Lake is the largest reservoir in the Bear Creek Basin. It is used for recreation and as a water supply for the Talent Irrigation District (TID), which serves 17,550 acres in the basin, as well as the Medford Irrigation District (MID) and the Rogue River Irrigation District (RRID). Bear Creek's flow pattern is opposite that of a normal stream; high average flows typically occur during the summer irrigation season when TID releases water from Emigrant Lake. Currently during the summer, TID withdraws 45 cubic feet per second (cfs) of irrigation water at Oak Street in Ashland, while the Medford Irrigation District (MID) withdraws about 25 cfs further downstream. Lowest flows occur in the late fall and early spring. At times, much of Bear Creek's flow at Oak Street in Ashland is wastewater treatment plant effluent.

The major water quality concerns for Bear Creek include low dissolved oxygen (DO), nuisance aquatic plant growth, and toxicity. Concerns also have been raised by the Department of Environmental Quality (DEQ) regarding such nutrients as phosphorus and nitrogen. Stringent temperature criteria also have been set, but DEQ has acknowledged repeatedly that variances to this limit would be allowed. Due to these water quality concerns, Bear Creek has been designated a water quality limited stream. The Clean Water Act requires DEQ to establish Total Maximum Daily Loads (TMDLs) for water quality limited streams. TMDLs represent the amount of pollutant a stream can assimilate without impairing the water quality or beneficial uses of the stream. Preliminary TMDLs have been established, along with a Waste Load Allocation (WLA) for the Ashland Wastewater Treatment Plant (WWTP). The treatment standards imposed on the plant will be dictated by the WLA and reflected in the WWTP's discharge permit. DEQ will set the most stringent permit limits during the summer months when warmer water poses the greatest threat to fisheries; in fact, the preliminary summer permit limits are some of the most stringent in the country.

Population

A growth rate of 1 percent was assumed for the planning period. Using the 1990 population of 17,172 as a base, the expected population for the year 2015 is 22,000. These figures do not include Southern Oregon State College and tourist populations, which, in 1988, numbered approximately 6,300. These seasonal populations contribute to plant flow and are included in the flow projections.

Wastewater Flows

Wastewater flows were determined by using the year 2015 population projections and considering trends in water use and sewer rehabilitation efforts. Three categories of flow are of primary interest. The average dry weather flow is currently 1.72 million gallons per day (mgd) and expected to increase to 2.17 mgd in the year 2015. The peak month flow is 2.5 mgd and projected to reach 3.2 mgd. The peak wet weather flow is 6.7 mgd, increasing to 8.5 at the end of the design period.

TREATMENT ALTERNATIVE EVALUATION

The treatment alternative evaluation process involved identifying many potential options for consideration. Screening criteria then were applied to these alternatives for detailed development of a limited number of promising alternatives.

Alternatives Considered

A wide variety of treatment alternatives initially were considered. Alternatives ranged from abandonment of the existing plant and conveying wastewater to Medford to an advanced treatment plant using only recently proven technologies. These alternatives included:

- Abandon the Ashland WWTP; raw sewage to Medford WWTP.
- Abandon Ashland WWTP; raw sewage to Medford WWTP with flow equalization.
- Limited plant modifications; treated effluent to Medford in winter, summer effluent irrigation on city property.
- Limited plant modifications; treated effluent to Medford both winter and summer.
- Major plant modifications; treated effluent to Bear Creek in winter, summer effluent irrigation on city property.
- Major plant modifications; treated effluent to Bear Creek in winter, summer effluent to Talent Irrigation District.

- Major plant modifications; treated effluent to Bear Creek in winter, summer effluent to Medford.

- Advanced wastewater treatment with nutrient removal and year-round discharge to Bear Creek.

- Flow augmentation to Bear Creek.

Alternative Screening

To develop the most promising alternatives, a screening process was applied to the list of alternatives. Pass-fail questions were applied to each alternative, regarding such issues as technical feasibility, environmental impact, reliability, and flexibility. The initial screening resulted in six remaining alternatives.

The alternatives then were refined with the input from the city council, the community, and city staff. Additional screening was conducted, resulting in the following three alternatives for detailed development:

- Wastewater Treatment in Medford
- Summer Irrigation of City Property (winter discharge to Bear Creek)
- Advanced Wastewater Treatment

TREATMENT ALTERNATIVE DEVELOPMENT

Detailed sizing, site layouts, and costs were developed for the remaining three alternatives.

Wastewater Treatment in Medford

Under this alternative, Ashland's treatment plant would be abandoned and raw sewage conveyed approximately 20 miles north to Medford's treatment plant. The Bear Creek Valley Sanitary Authority (BCVSA) sewer, approximately seven miles from the Ashland plant, has sufficient capacity north of Talent to accommodate Ashland's flows. A 30-inch-diameter sewer would be constructed from the plant to connect to the 36-inch BCVSA sewer near Phoenix.

Ashland would pay an initial systems development fee to both BCVSA and Medford to pay for their use of the system capacity. In addition, normal monthly service charges would be charged by the City of Medford. Ashland would be the single largest customer of the Medford facility and would not receive membership representation on the Regional Rate Commission.

Summer Irrigation of City Property

Ashland's plant would undergo a major phased upgrade to increase capacity, reliability, and treatment efficiency. Capacity will be added to meet year the 2015 projected population demands. Among the renovations are: updating the current activated sludge technology; adding odor control to the plant's headworks; addressing ammonia toxicity concerns by adding more aeration capacity for full nitrification; producing a very high quality effluent through additional secondary clarification capacity and tertiary filtration to meet expected biochemical oxygen demand (BOD) and suspended solids (SS) limits; and either updating or replacing the existing chlorine disinfection system. The system would be updated with a chlorine scrubber and dechlorination system or replaced by an ultraviolet disinfection system. Effluent would be discharged through a new outfall to Bear Creek during the winter months. During the summer, effluent would be applied to an irrigation site east of Interstate 5. A storage lagoon would balance flow with irrigation needs. It is anticipated that much of the irrigation site would remain pastureland, although opportunities exist for growing alternative crops such as trees.

The city council has expressed an interest in evaluating a natural wetlands system in conjunction with the treatment plant upgrades. Initially, a portion of the effluent from this facility would be discharged to a demonstration wetlands located adjacent to the plant. The wetland effluent would be returned for spray irrigation during the evaluation period. The wetlands' ability to remove nutrients and moderate effluent temperature would be evaluated, and future site expansions may be modified based upon the findings of this study. In addition, wildlife habitat would be created, along with opportunities for community education regarding wastewater treatment.

Sludge treatment capacity would be improved with a second digester and a new digester control building. A new sludge truck would permit reliable application of sludge year-round.

Advanced Wastewater Treatment

This alternative would allow effluent discharge directly to Bear Creek year-round. To do so, virtually all the phosphorus and ammonia in the wastewater must be removed. This alternative shares many of the features of the Summer Irrigation of City Property alternative. The basic technology is similar, although more chemical addition, sedimentation, and filtration would be required. Significantly more sludge would be produced in this process. There are few facilities of this type currently in existence.

Alternative Costs

The capital and present worth cost of these three alternatives is shown in Table 2-1.

Table 2-1. Cost Comparison

Cost item, $1,000	Alternative		
	Wastewater Treatment in Medford	Summer Irrigation of City Property	Advanced Wastewater Treatment
Capital cost	21,782	27,086	37,403
Annual cost	783	904	1,231
Present worth of annual cost[1]	10,641	12,286	16,729
Salvage value	(3,944)	(5,436)	(4,069)
Present worth of salvage value[1,2]	(1,800)	(2,481)	(1,857)
Total present worth[1]	30,623	36,891	52,275

Notes

1 Based on discount rate of 4 percent and a 20-year study period.
2 Salvage value based on straight line depreciation over study period.

The capital costs are planning level costs estimated to build the facility in July 1998. They include a 25 percent allowance for contingency and a 25 percent allowance for engineering. These allowances are conservatively high due to the uncertainty related to Ashland's wastewater permit. Present worth costs factor in capital cost, operations and maintenance costs, and the salvage value of a facility. Present worth costs permit a comparison of the total facility cost over the life of the project.

FINAL TREATMENT ALTERNATIVE SELECTION

The last step in selecting a recommended plan included a series of public hearings and work sessions. At these meetings, the public again was allowed to ask questions and voice concerns. The council discussed the advantages and disadvantages of each alternative. At the close of the public comment period, the council concurred with the city staff recommendation to select the Summer Irrigation of City Property alternative with winter discharge to Bear Creek.

The council's decision allows flexibility, has community support, is relatively affordable, is technically feasible, and is acceptable to regulatory agencies. Furthermore, it incorporates the advantages of many other alternatives and includes provisions for future refinement as additional information becomes available. It also allows for wetlands system testing and evaluation.

A key factor in the success of the recommended plan is the logical phasing of the improvements.

PROJECT PHASING

Some advantages of project phasing are matching project expenditures to revenue generation, executing selected tasks more rapidly, and incorporating the findings of wetlands system studies into subsequent design. The recommended project is broken into three phases to address immediate near-term and then long-term process needs. In addition, the city has expressed interest in a number of opportunities which will continue through all phases of the project. They include: development of community support for further reduction in phosphate generation; reduction in number of garbage disposals; and flow reduction through water conservation.

Figure 2-1 shows a flow schematic and site plant for the recommended alternative. Figure 2-2 shows the phasing of improvements on the plant site.

Phase 1

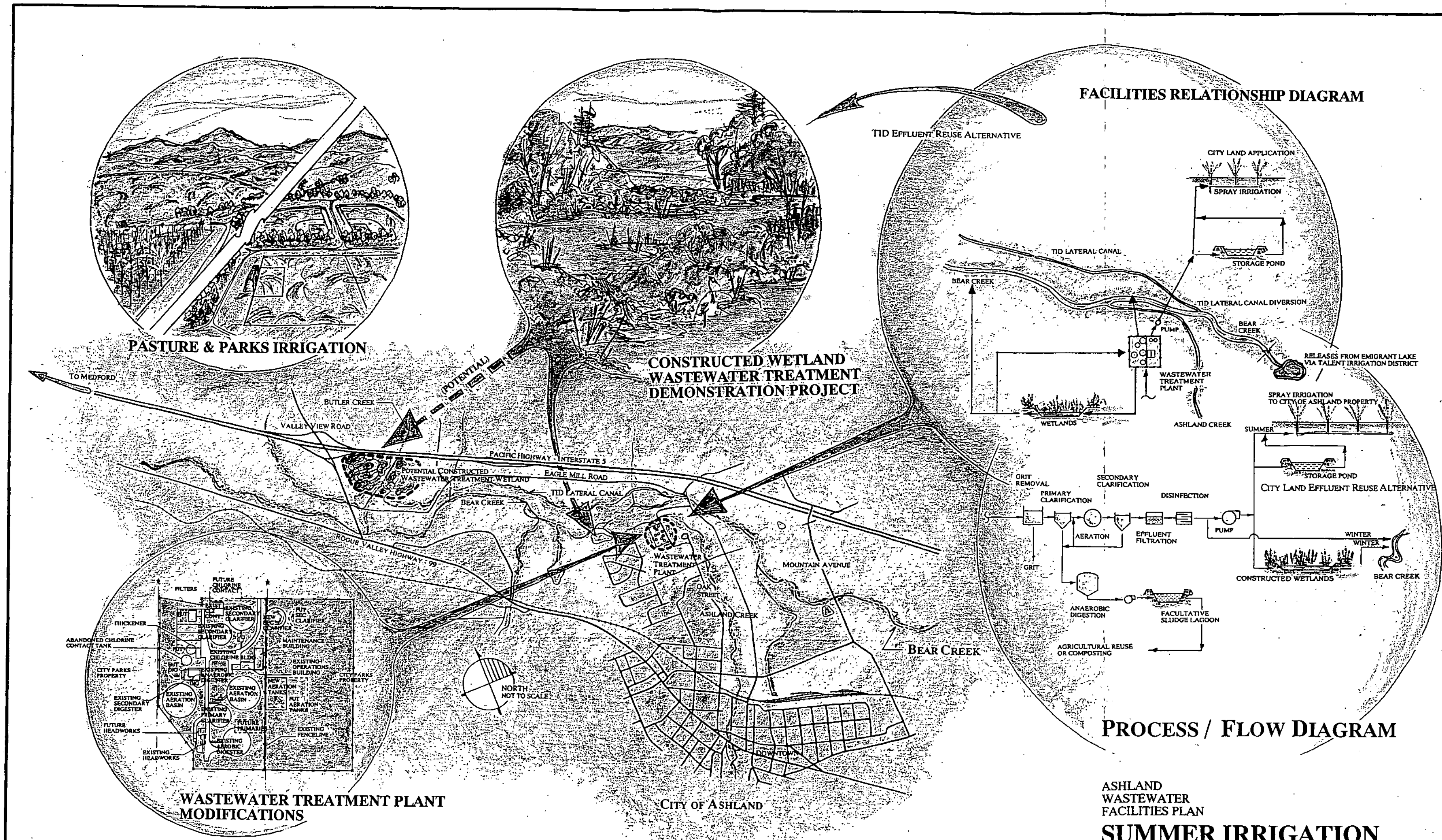
Phase 1 incorporates immediate needs and will last 3 years to provide treatment plant reliability upgrades as soon as possible. In addition, water quality concerns related to ammonia and BOD will be addressed as much as possible using the existing process units. Current chlorine toxicity problems will be eliminated either by adding dechlorination or converting to ultraviolet disinfection. Odor control will be added to the headworks during Phase 1. Effluent irrigation property will be purchased. The design, establishment, and evaluation of demonstration wetlands is included in this phase.

Phase 2

In this phase, all proposed permit requirements will be met, with the possible exception of temperature. Effluent irrigation equipment and pumping stations will be installed to serve the property purchased in the previous phase. A small component of growth will be factored into the design of this phase, extending from 1999 until 2001. A major expansion to the sludge treatment and disposal system will include a second digester and a new digester control building.

Phase 3

The final phase of the wastewater treatment improvements will accommodate growth until the year 2015, the end of the planning period. Flexibility will be added to the sludge handling system, including sludge thickening and the potential for sludge composting. In addition, a provision for Level 4 irrigation of city parks and open spaces can be added.



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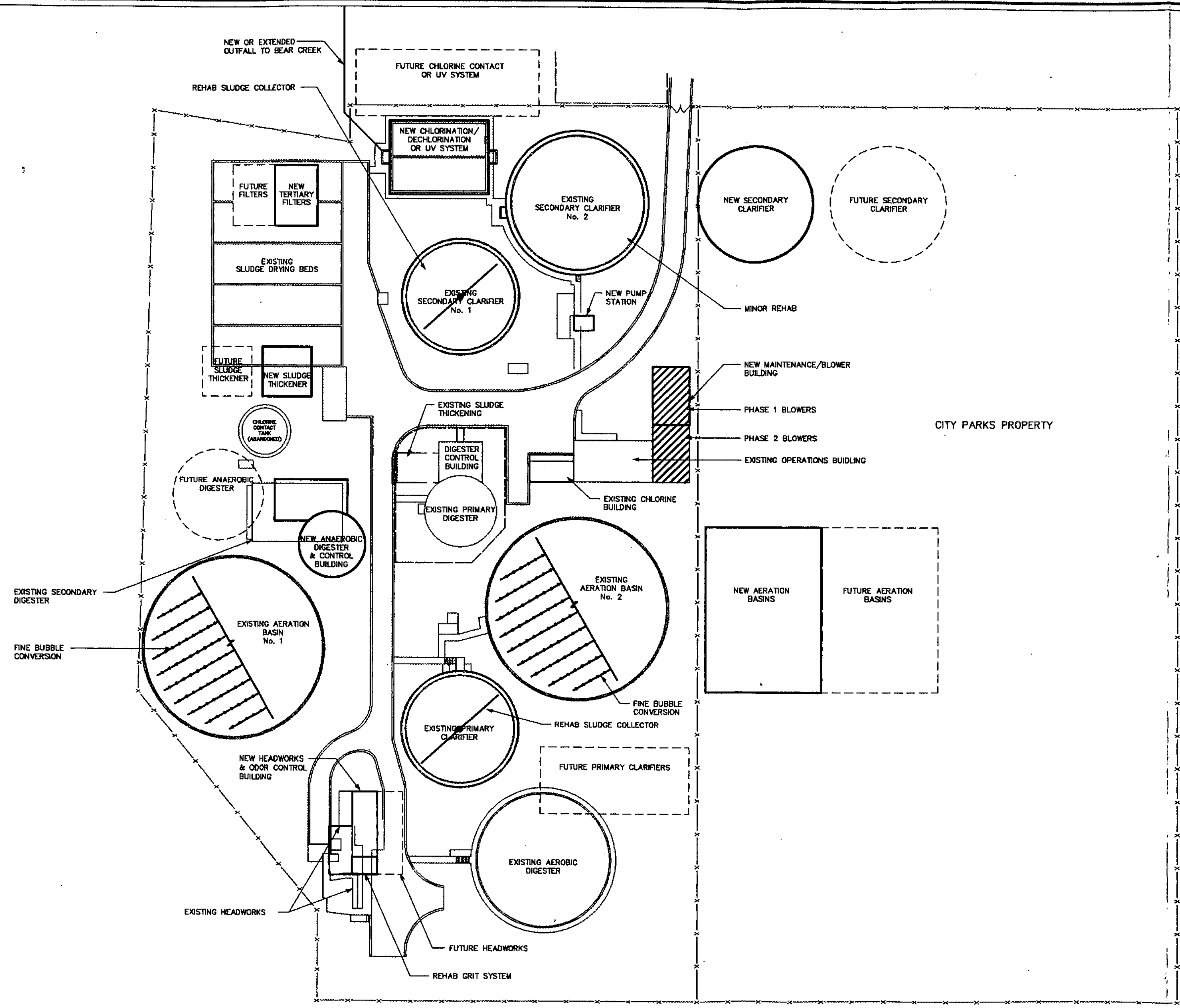
BROWN & CALDWELL

ASHLAND
WASTEWATER
FACILITIES PLAN

SUMMER IRRIGATION OF CITY PROPERTY

CITY OF ASHLAND, OREGON SEPTEMBER 19, 1995

Fig. 2-1



LEGEND

- PHASE 1
- PHASE 2
- PHASE 3

NOTES

1. "FUTURE" REFERS TO IMPROVEMENTS BEYOND YEAR 2015. SHOWN ONLY FOR LAYOUT PURPOSES.

FIGURE 2-2

WWTP SITE LAYOUT
SUMMER IRRIGATION ALTERNATIVE
PHASING

PROJECT SCHEDULE

Key elements of the project schedule include:

Phase 1

- Submit draft Facilities Plan to the city and DEQ by October 1, 1995.
- Coordinate with DEQ review of Facilities Plan, to be completed by January 1, 1996.
- Coordinate permit development by DEQ by January 1, 1996.
- Begin design of Phase 1 improvements by January 1, 1996.
- Complete design of all Phase 1 improvements by October 1, 1996.
- Begin construction of selected Phase 1 improvements by May 1996.
- Complete Phase 1 improvements by November 1, 1998.

Phase 2

- Begin design of Phase 2 improvements by October 1998.
- Begin construction of Phase 2 improvements by June 1999.
- Complete Phase 2 improvements by January 2001.

Phase 3

- Begin design of Phase 3 by October 2001.
- Begin construction by April 2002.
- Complete Phase 3 construction by April 2003.

CONCLUSION

Following a thorough and comprehensive process, the city has selected an alternative to serve its long-term needs. Not only is the primary need for wastewater treatment addressed by this selected alternative, but also many secondary benefits will be realized, such as the desire to pursue passive treatment technologies, the creation of wildlife habitat, and the goal of public education can be attained. The city recognizes the value of their water resources and believes it must be used responsibly over and over to maintain the health of the Bear Creek Basin. The selected alternative, which is developed in detail in subsequent chapters, will allow the city to create a model effluent reuse program.

CHAPTER 10

RECOMMENDED PLAN

A wide variety of alternatives have been developed, screened, and compared in the preceding chapters. Three alternatives remained for consideration: Wastewater Treatment in Medford, Summer Irrigation of City Property (winter discharge to Bear Creek), and Advanced Wastewater Treatment. Each alternative has features which would make it a viable long-term solution to Ashland's wastewater treatment needs. This chapter describes the final alternative selection process and presents a recommended plan for implementation.

FINAL ALTERNATIVE SELECTION

The last step in developing a recommended plan included a series of public hearings and work sessions. At these meetings, the public again was allowed to ask questions and voice concerns. The council discussed the advantages and disadvantages of each alternative. At the close of the public comment period, the council concurred with the city staff recommendation to select the Summer Irrigation of City Property alternative with winter discharge to Bear Creek.

The selected alternative has community support, is relatively affordable relative to other alternatives, is technically feasible, and is acceptable to regulatory agencies. Furthermore, it incorporates the advantages of many other alternatives considered and will permit future refinement as additional information becomes available. The city council is committed to an early evaluation and testing of a pilot/demonstration wetlands system.

A key factor in the success of the recommended plan is the logical phasing of the improvements. In subsequent sections of this chapter, project phasing and detailed scheduling of study, design, construction, and start-up tasks are outlined.

PROJECT PHASING

We suggest the city phase the recommended improvements for a number of reasons. First, the city has committed to a good faith effort to make key plant improvements as soon as possible. The design and construction of an incremental project can be implemented more rapidly than one, massive plant upgrade. This approach also will ensure greater plant reliability and minimize odor potential sooner.

Secondly, a phased approach is more compatible with the city's financing program. Less bond indebtedness will likely result from a phased expansion program.

Lastly, a phased approach will permit the city to test effluent from the demonstration wetlands project. While these systems have shown some promise in other areas of the country, local experience with these treatment systems is limited. A phased approach will permit testing and evaluation prior to sizing major treatment components.

Phase 1 Improvements

The first phase of improvements will serve the city until the middle of 1998 when design of Phase 2 improvements will begin. The goal of the initial phase of improvements is to provide upgrades for plant reliability and reduce current water quality violations as much as possible using existing process units. Chlorine toxicity will be eliminated, and some reductions in ammonia and biochemical oxygen demand (BOD) discharges are expected.

A detailed explanation of the complete plant expansion and its components is provided in Chapter 9. Reasons for specific elements included in Phase 1 are listed below.

<u>Headworks</u>

Bar screen:	Provide improved solids removal and increase reliability.
Grit removal:	Add reliability to existing equipment.
Odor control:	Reduce potential for odor production in typically one of the most troublesome plant areas.

<u>Primary Clarification</u>

Primary clarifier:	Enhance reliability by overhauling collector.

<u>Secondary Process</u>

Aeration basins and blowers:	Retrofit existing aeration basins with fine bubble diffusers for more reliability and higher ammonia removals. An interim anoxic selector process may be added to the existing system to enhance ammonia removal for the near term. A new anoxic selector will be provided with the new aeration basins in Phase 2.
Secondary clarifiers:	Overhaul for greater reliability and treatment efficiency.
Disinfection:	Add either chlorination/dechlorination with emergency leakage scrubbing or convert to UV to eliminate toxic chlorine discharges.

Relocate Outfall to Bear Creek:	Relocate the outfall for winter discharge from Ashland Creek to Bear Creek to accommodate Department of Environmental Quality (DEQ) preference and permit limitations. This relocation will allow DEQ to establish an effluent mixing zone in the Bear Creek discharge permit. It is expected that a permit based upon discharge to Bear Creek would have significantly higher permit limits than those expected for Ashland Creek.

Effluent Irrigation

Irrigation site:	Acquire approved irrigation site to guarantee future access.

Wetlands Treatment

Demonstration wetlands:	Develop performance data from wetlands with regard to effluent polishing and temperature conditioning. Also create wildlife habitat and promote public awareness of wastewater treatment issues.

Soil Filtration

Soil filter:	As a part of the wetlands system evaluation, council will consider investigation of phosphorus removal via soil filtration at end of Phase 1. This study will help determine if year-round discharge to Bear Creek is feasible.

A breakdown of the Phase 1 expansion costs is given in Table 10-1. Figure 10-1 shows a layout of the treatment plant following the completion of Phase 1. Figure 10-2 shows the offsite improvements included in Phase 1.

Phase 2 Improvements

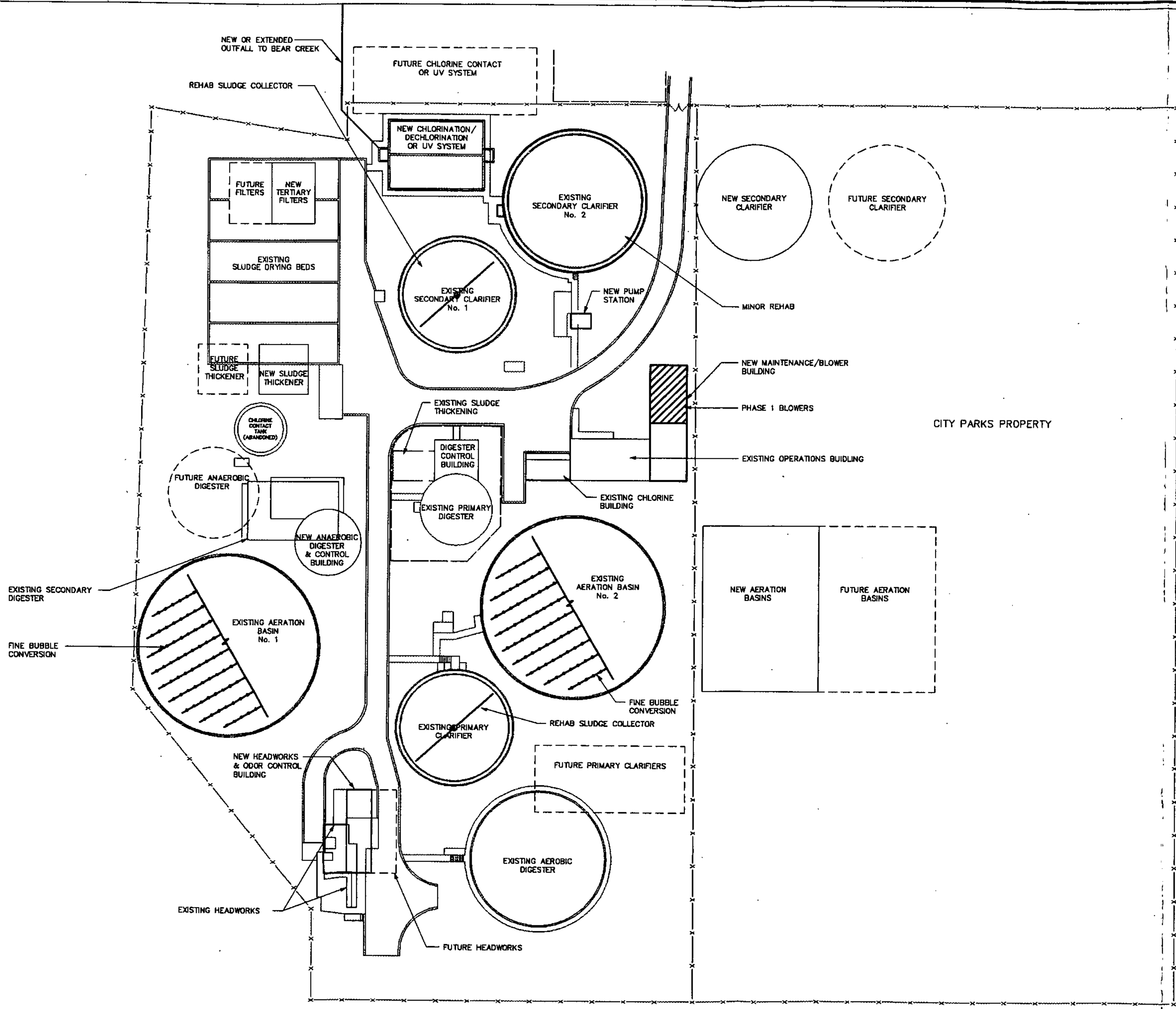
Phase 2 improvements occur during year 3 to year 6 (approximately 1998 to 2001). During this phase, the plant will be brought into full permit compliance (with the possible exception of temperature standards which are anticipated to be modified by DEQ's triennial review process), and treatment capacity will be added to accommodate growth through the year 2001. The information acquired from the wetlands system testing programs will be used to determine final process unit sizing. If it appears more cost effective to use an expanded wetlands system, these technologies can be incorporated.

Table 10-1. Phase 1 Cost Estimate

Item	Phase 1 Cost, $1,000
Headworks, including odor control	435
Grit removal	--
Primary clarifier	131
Aeration basins, existing	244
Aeration basins, new	419
Blowers (including building)	656
Secondary clarifier No. 1	186
Secondary clarifier No. 2	12
Secondary clarifier No. 3	--
Disinfection	193
Chlorine scrubbing	129
Chemical feed/flocculation	--
Tertiary filter	--
Outfall	100
Irrigation pumping stations	--
Effluent storage/irrigation system[4]	--
Anaerobic digester No. 2	--
Digester control building	--
Demolish secondary digester	--
Sludge thickener	--
Facultative sludge lagoon[2]	--
Sludge transport	--
Subtotal	2,505
Electrical/instrumentation[6]	501
Yard piping[6]	501
Contractor indirect costs[7]	326
Subtotal	3,832
Wetlands[3]	338
Subtotal	4,170
Contingency at 25%	1,043
Subtotal	5,213
Engineering/administration at 25%	1,303
Subtotal	6,516
Land[5]	1,046
Total capital cost	7,562

Notes:

1 Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
2 Includes sludge force main and pumping station.
3 Cost taken from Woodward-Clyde Facilities Plan Addendum.
4 Pond would provide 30 days' worth of effluent storage.
5 Assumes purchase of 700 acres for irrigation.
6 Estimated at 20% of subtotal.
7 Estimated at 13% of subtotal.



NOTES

1. COLORED PROCESS UNITS ARE INCLUDED IN PHASE 1.
2. "FUTURE" REFERS TO IMPROVEMENTS BEYOND YEAR 2015. SHOWN ONLY FOR LAYOUT PURPOSES.

FIGURE 10-1

WWTP SITE LAYOUT
SUMMER IRRIGATION ALTERNATIVE
PHASE 1

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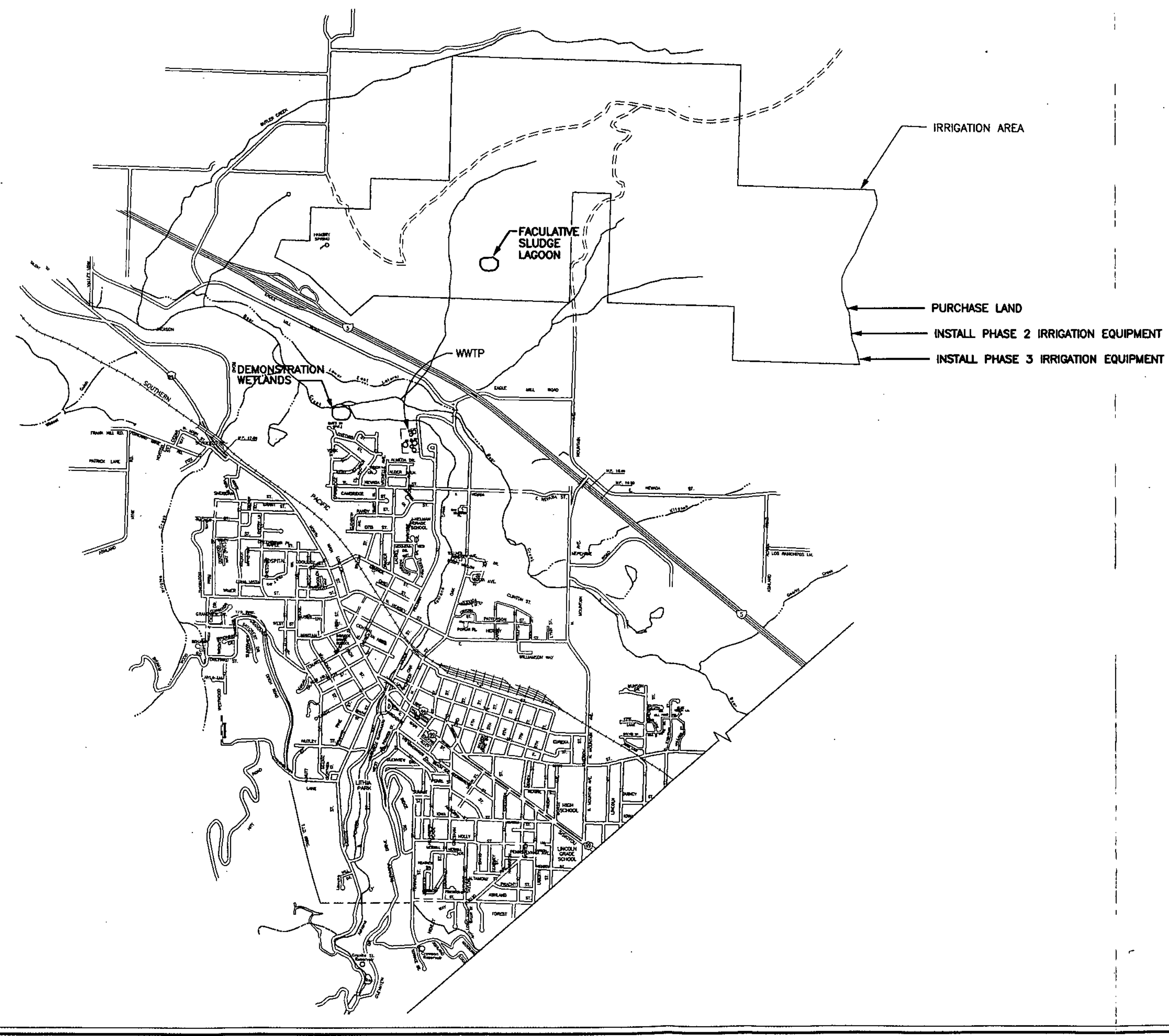


FIGURE 10-2

WASTEWATER TREATMENT FACILITES LOCATION MAP

The rationale for including specific plant improvements in Phase 2 are noted below.

Secondary Process

Aeration basins and blowers:	Provide new aeration basins, anoxic selector system, and additional blowers to comply with the ammonia limit and also provide additional treatment capacity for growth.
Tertiary Filtration	Provide filtration to meet the anticipated stringent BOD and suspended solids standards.

Effluent Irrigation

Irrigation pumping station, effluent storage/irrigation:	Construct a reclaimed water holding pond and effluent irrigation system for compliance with summer permit limits.

Sludge Treatment/Disposal

Sludge digester No. 2:	Build second sludge digester to accommodate growth and enhance reliability and treatment efficiency. Two digesters are critical to maintain reliable operation in the event of an process upset.
Digester control building:	Build a new digester control building for the expanded digester complex. New electrical service and controls will be needed to replace 30-year-old equipment.
Demolish secondary digester:	Demolish 40-year-old secondary digester to permit construction of the new digester.
Sludge transport:	Add a new sludge hauling truck for reliability.

A breakdown of the Phase 2 expansion costs is detailed in Table 10-2. Figure 10-3 shows a layout of the treatment plant following the completion of Phase 2. Figure 10-2 shows the offsite improvements included in Phase 2.

Phase 3 Improvements

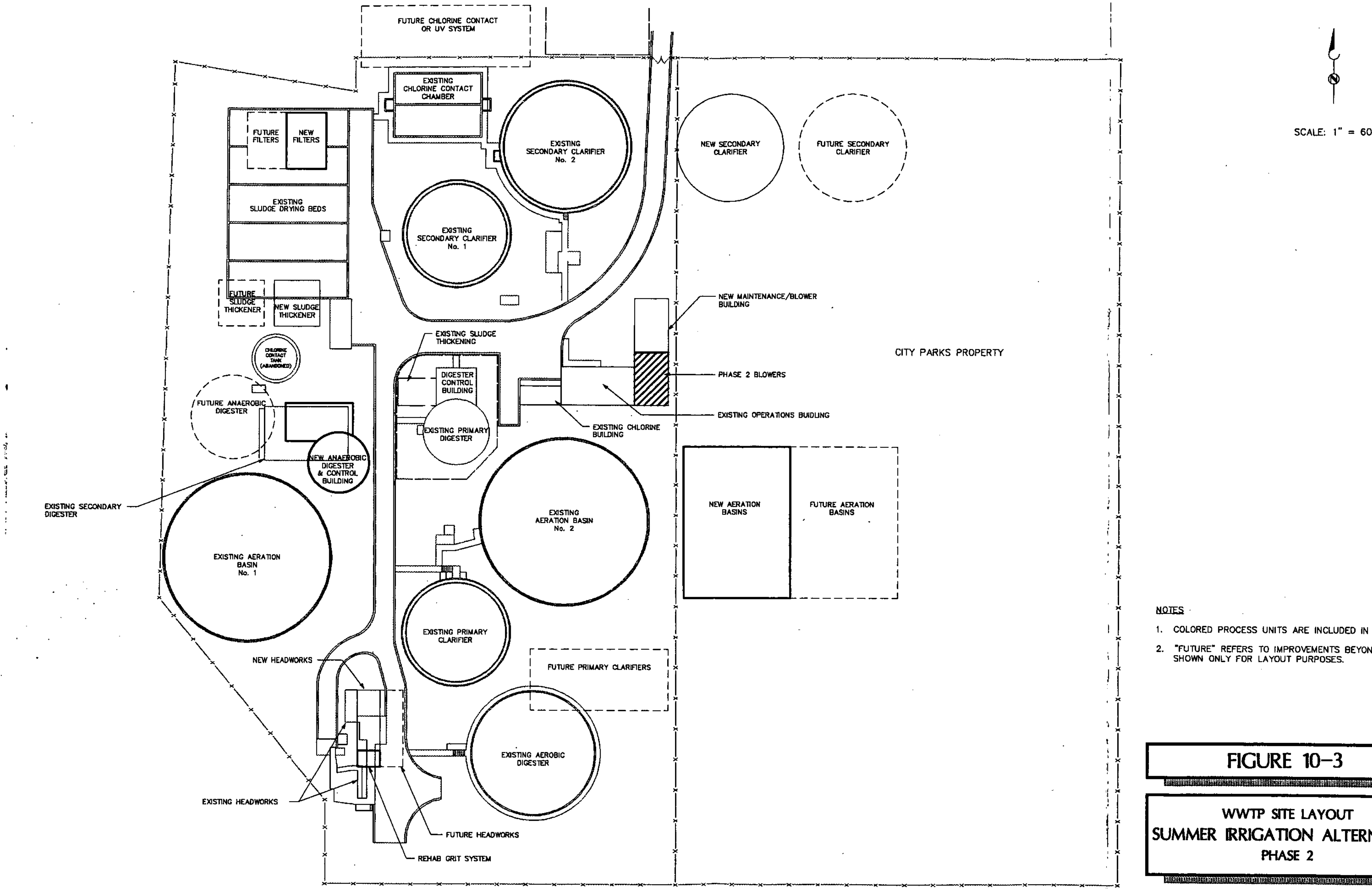
The final phase of wastewater treatment improvements will accommodate growth from 2001 to 2015, the end of the planning period. In addition, added system flexibility will be provided for the effluent irrigation system and the sludge handling system. Phase 3 improvements and the reasons for their inclusion are as follows:

Table 10-2. Phase 2 Cost Estimate

Item	Phase 2 Cost, $1,000
Headworks, including odor control	-
Grit removal	15
Primary clarifier	-
Aeration basins, existing	-
Aeration basins, new	1,257
Blowers (including building)	164
Secondary clarifier No. 1	-
Secondary clarifier No. 2	-
Secondary clarifier No. 3	-
Disinfection	-
Chlorine scrubbing	-
Chemical feed/flocculation	-
Tertiary filter	469
Outfall	-
Irrigation pumping stations	274
Effluent storage/irrigation system[4]	1,598
Anaerobic digester No. 2	609
Digester control building	447
Demolish secondary digester	139
Sludge thickener	-
Facultative sludge lagoon[2]	-
Sludge transport	216
Subtotal	5,189
Electrical/instrumentation[6]	1,038
Yard piping[6]	1,038
Contractor indirect costs[7]	675
Subtotal	7,940
Wetlands[3]	-
Subtotal	7,940
Contingency at 25%	1,985
Subtotal	9,925
Engineering/administration at 25%	2,481
Subtotal	12,406
Land[5]	-
Total capital cost	12,406

Notes:

1 Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
2 Includes sludge force main and pumping station.
3 Cost taken from Woodward-Clyde Facilities Plan Addendum.
4 Pond would provide 30 days' worth of effluent storage.
5 Assumes purchase of 700 acres for irrigation.
6 Estimated at 20% of subtotal.
7 Estimated at 13% of subtotal.



NOTES

1. COLORED PROCESS UNITS ARE INCLUDED IN PHASE 2.
2. "FUTURE" REFERS TO IMPROVEMENTS BEYOND YEAR 2015. SHOWN ONLY FOR LAYOUT PURPOSES.

FIGURE 10-3

WWTP SITE LAYOUT
SUMMER IRRIGATION ALTERNATIVE
PHASE 2

438452.DWG 9/15/95 | Ashland.pcp

Secondary Process

Secondary clarifiers:	Add a third secondary clarifier to accommodate growth.
Tertiary filtration:	Evaluate the need and desire to provide Level 4, the highest level of irrigation water. If Level 4 irrigation is selected, add tertiary filters, along with provisions for chemical addition and flocculation. This effluent can be used to irrigate such areas as city parks and golf courses if the city so chooses at a later date.

Effluent Irrigation

Expanded irrigation system:	Add irrigation equipment to the irrigation site to accommodate growth.

Sludge Treatment/Disposal

Sludge thickener:	Provide sludge thickening to increase the treatment capabilities of the two sludge digesters to accommodate growth. The selection of thickener technology will be influenced by a decision to compost part or all of the sewage sludge.
Sludge lagoon:	Provide storage and flexibility to the sludge handling system. Storage will be required during periods when sludge cannot be applied to land. The ultimate sizing of the sludge lagoon would be influenced by a decision to dewater and/or compost digested sludge.

A breakdown of the Phase 3 expansion costs is outlined in Table 10-3. Figure 10-4 shows a layout of the treatment plant following the completion of Phase 3. Figure 10-2 shows the offsite improvements included in Phase 3.

A cost estimate summary for all three alternatives is provided as Table 10-4.

RECOMMENDED PROJECT SCHEDULE

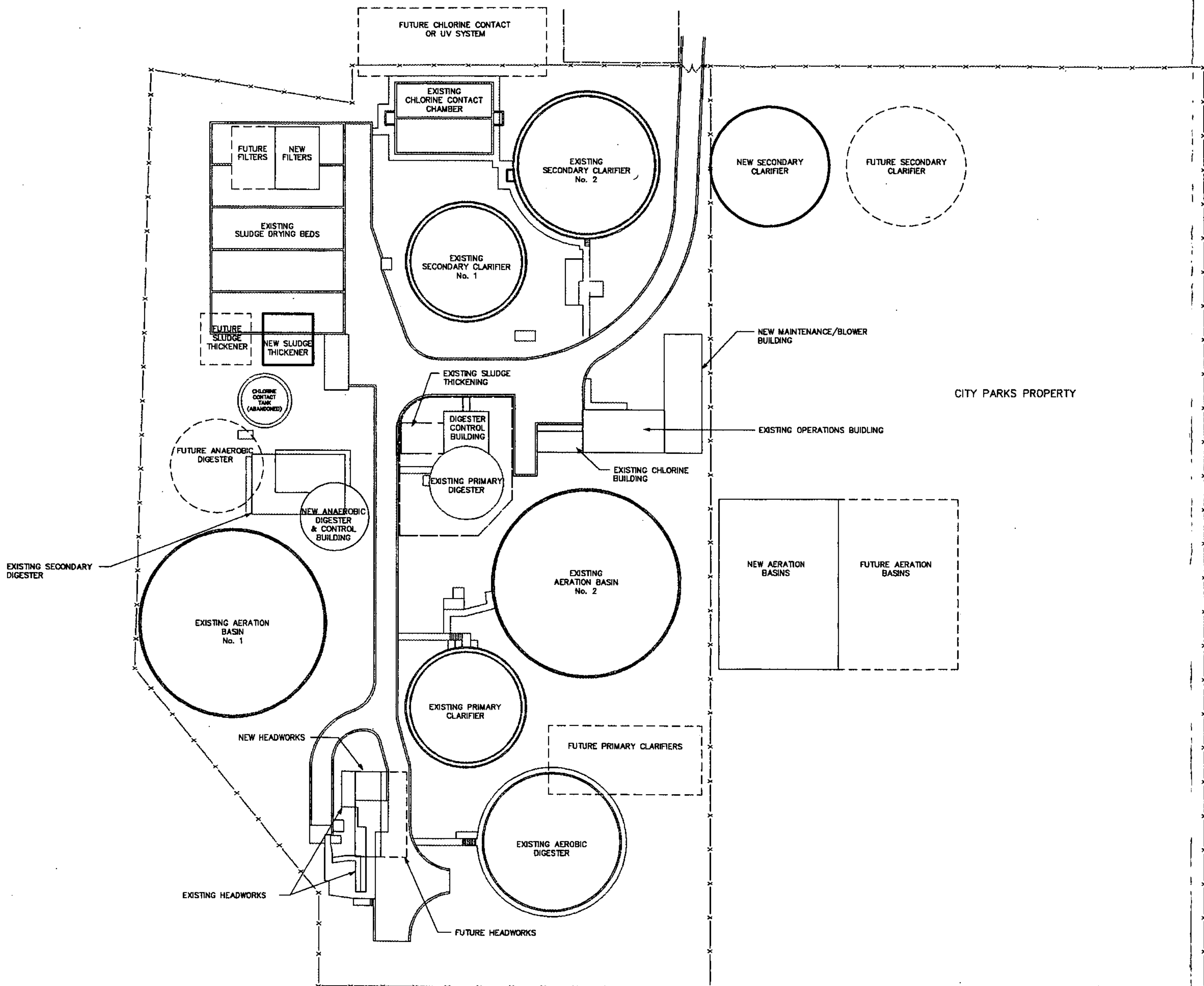
Scheduling of design and construction for each of the three project phases is shown in Figure 10-5. The draft facilities plan will be submitted to DEQ by October 1, 1995. It is expected that DEQ will complete its review of this document concurrent with the completion of Ashland's wastewater discharge permit. The permitting process should be completed by the end of 1995. If these permit conditions are not completed or the facilities plan is not approved at this time, the city may need to review and adjust their remaining schedule which represents an aggressive program to reach compliance.

Table 10-3. Phase 3 Cost Estimate

Item	Phase 3 Cost, $1,000
Headworks, including odor control	-
Grit removal	-
Primary clarifier	-
Aeration basins, existing	-
Aeration basins, new	-
Blowers (including building)	-
Secondary clarifier No. 1	-
Secondary clarifier No. 2	-
Secondary clarifier No. 3	702
Disinfection	-
Chlorine scrubbing	-
Chemical feed/flocculation	200
Tertiary filter	235
Outfall	-
Irrigation pumping stations	-
Effluent storage/irrigation system[4]	500
Anaerobic digester No. 2	-
Digester control building	-
Demolish secondary digester	-
Sludge thickener	540
Facultative sludge lagoon[2]	801
Sludge transport	-
Subtotal	2,977
Electrical/instrumentation[6]	595
Yard piping[6]	595
Contractor indirect costs[7]	387
Subtotal	4,555
Wetlands[3]	-
Subtotal	4,555
Contingency at 25%	1,139
Subtotal	5,694
Engineering/administration at 25%	1,424
Subtotal	7,118
Land[5]	-
Total capital cost	7,118

Notes:

1 Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
2 Includes sludge force main and pumping station.
3 Cost taken from Woodward-Clyde Facilities Plan Addendum.
4 Pond would provide 30 days' worth of effluent storage.
5 Assumes purchase of 700 acres for irrigation.
6 Estimated at 20% of subtotal.
7 Estimated at 13% of subtotal.



SCALE: 1" = 60'

NOTES

1. COLORED PROCESS UNITS ARE INCLUDED IN PHASE 3.
2. "FUTURE" REFERS TO IMPROVEMENTS BEYOND YEAR 2015. SHOWN ONLY FOR LAYOUT PURPOSES.

FIGURE 10-4

WWTP SITE LAYOUT
SUMMER IRRIGATION ALTERNATIVE
PHASE 3

438453.DWG 9/15/95

Table 10-4. Cost Estimate Summary

Item	Phase 1 Cost, $1,000	Phase 2 Cost, $1,000	Phase 3 Cost, $1000	Total Cost, $1,000
Headworks, including odor control	435	-	-	435
Grit removal	-	15	-	15
Primary clarifier	131	-	-	131
Aeration basins, existing	244	-	-	244
Aeration basins, new	419	1,257	-	1,675
Blowers (including building)	656	164	-	820
Secondary clarifier No. 1	186	-	-	186
Secondary clarifier No. 2	12	-	-	12
Secondary clarifier No. 3	-	-	702	702
Disinfection	193	-	-	193
Chlorine scrubbing	129	-	-	129
Chemical feed/flocculation	-	-	200	200
Tertiary filter	-	469	235	704
Outfall	100	-	-	100
Irrigation pumping stations	-	274	-	274
Effluent storage/irrigation system[4]	-	1,598	500	2,098
Anaerobic digester No. 2	-	609	-	609
Digester control building	-	447	-	447
Demolish secondary digester	-	139	-	139
Sludge thickener	-	-	540	540
Facultative sludge lagoon[2]	-	-	801	801
Sludge transport	-	216	-	216
Subtotal	2,505	5,189	2,997	10,672
Electrical/instrumentation[6]	501	1,038	595	2,134
Yard piping[6]	501	1,038	595	2,134
Contractor indirect costs[7]	326	675	387	1,387
Subtotal	3,832	7,940	4,555	16,328
Wetlands[3]	338	-	-	338
Subtotal	4,170	7,940	4,555	16,666
Contingency at 25%	1,043	1,985	1,139	4,166
Subtotal	5,213	9,925	5,694	20,832
Engineering/administration at 25%	1,303	2,481	1,424	5,208
Subtotal	6,516	12,406	7,118	26,040
Land[5]	1,046	-	-	1,046
Total capital cost	7,562	12,406	7,118	27,086

Notes:

1 Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
2 Includes sludge force main and pumping station.
3 Cost taken from Woodward-Clyde Facilities Plan Addendum.
4 Pond would provide 30 days' worth of effluent storage.
5 Assumes purchase of 700 acres for irrigation.
6 Estimated at 20% of subtotal.
7 Estimated at 13% of subtotal.

ASHLAND WASTEWATER TREATMENT PLANT OPTIONS - CONCEPTUAL SCHEDULE.

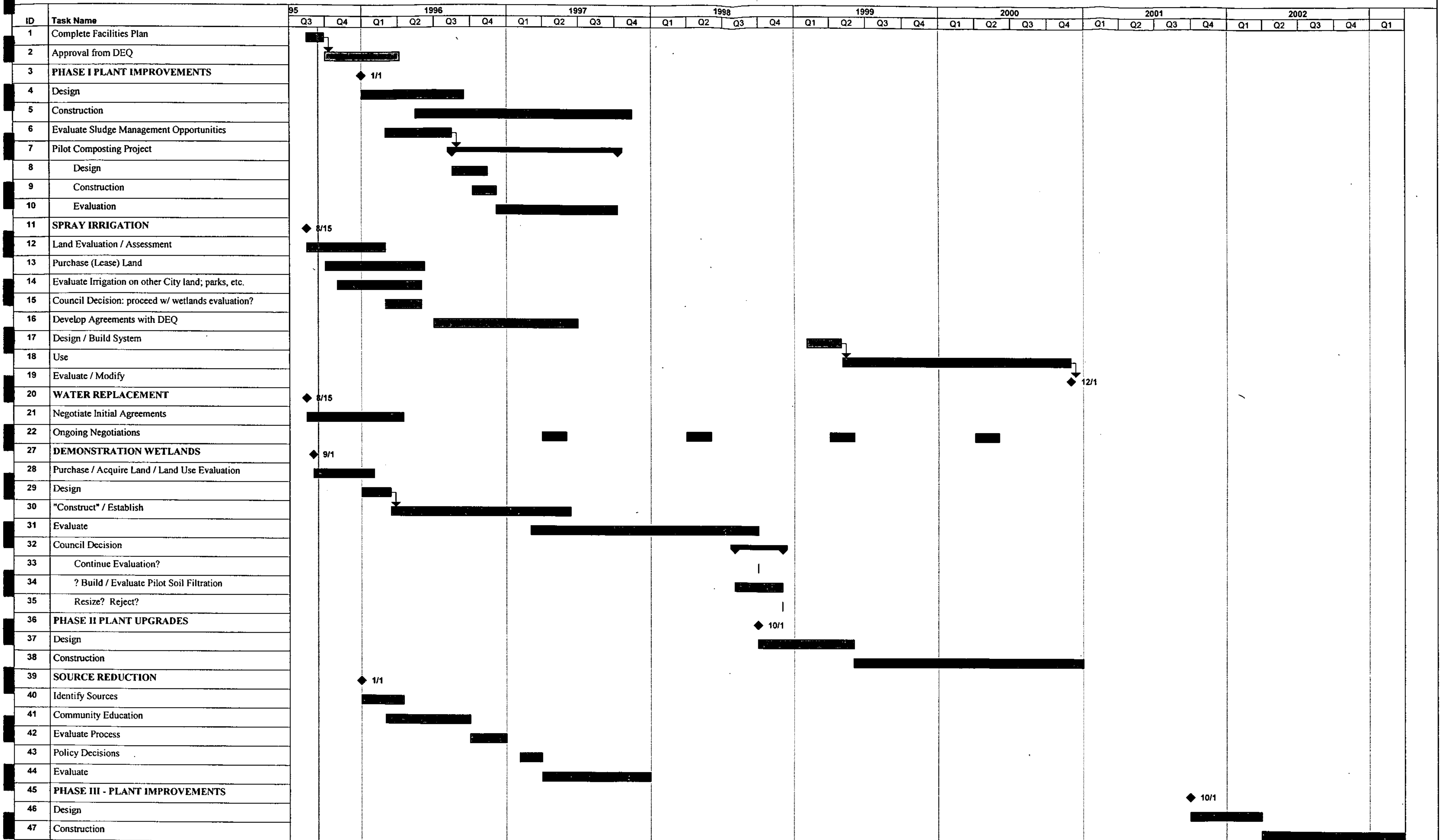


FIGURE 10-5 (Sep 12, 1995)

Phase 1

The Phase 1 plant improvement process can begin upon completion of the permitting process. Preliminary design will start in early January 1996. Irrigation land will be purchased as soon as possible to ensure availability and minimize cost. Final design should require eight months. The design and construction project can be broken into multiple construction phases to accommodate a fast-track schedule. Phase 1 improvements should be completed and operational by the end of 1997.

Phase 2

The demonstration wetland constructed under Phase 1 will be evaluated prior to the start of Phase 2 improvements in the fall of 1998. Data acquired from this study will be used in the design of the secondary treatment system improvements. Evaluation of a pilot soil filtration system, if deemed appropriate, would proceed in Phase 2 after the Phase 1 plant improvements have improved the effluent quality. Design of Phase 2 should take approximately eight months. Phase 2 construction will proceed for approximately 18 months, with start-up expected by the beginning of 2001.

Phase 3

Phase 3 design will start in the fall of 2001 and require approximately six months. Construction will begin mid-year in 2002 and be completed by mid-2003—approximately 12 months.

Steve
~~Dennis~~ BeK'sy

Council Communication
WWTP Discussion
Public Works Department
April 8, 1999
Study Session

Submitted by: Paula Brown Paula
Approved by: Mike Freeman MF

Title:
Wastewater Treatment Plant Discussion

Synopsis:
As construction is rapidly progressing at the wastewater treatment plant site, several questions have arisen regarding the off site spray irrigation and biosolids reuse portion of the plan. Staff was asked to provide an update to the City Council to answer many of these questions and provide clarification as necessary.

Recommendation:
This item is for information only. After careful reconsideration regarding the health and safety impacts of the project, staff is moving forward based upon Council's initial program decision. Staff will put the off site spray irrigation and biosolids project out to bid in April, and recommend the actual contract award be held until June 30, 1999, pending the LUBA decision.

Background Information:
In September 1995, after nearly ten years of debate and discussion, the City Council chose to maintain it's wastewater treatment program and reuse the effluent. The impetus for this decision was Ashland's desire to reuse the City's treated effluent, maintain a healthy Ashland Creek, including providing replacement water in the summer season, and focus on the Council Goals to:

- *Replace the volume of WWTP effluent removal from Bear Creek*
- *Support the natural ecology of Bear Creek*
- *Satisfy the DEQ standards for effluent from the WWTP*
- *Eliminate odors (to the extent possible) created by the WWTP*
- *Minimize capital and operating costs of the WWTP*
- *...give full consideration to... wetlands technology to assist in achieving the WWTP goals*

There is a tremendous amount of information regarding wastewater treatment and the reuse or disposal of treated wastewater byproducts - effluent (water) and solids (biosolids). The City is experiencing the fears and concerns that other municipalities and regulatory agencies have faced with respect to the wastewater process in general and specifically with the reuse of treated wastewater. Many of the comments that the City has received from the community are derived from fear, not fact, and not understanding how the treatment process works and how the treatment process actually changes the content of the effluent and biosolids.

The City is fully committed to providing for the health and safety of our citizens and neighbors, promoting higher quality in-stream water, and meeting all relevant regulations required for this project. The initial decision to keep the effluent for possible City irrigation or even direct reuse in the future demonstrates this commitment to health and safety. The plan is to use treated effluent water during the summer to irrigate a grazing crop on the City's property, and also to provide a better quality soil through use of the biosolid soil amendments. Regarding in-stream use, staff has received verbal confirmation from the State Water Master of the ability to transfer the existing TID water rights from the City owned irrigation property to leased in-stream rights and will continue to pursue this as the reuse project moves forward. Knowing their were fears and concerns, staff met with the neighbors and as a result changed design elements to accommodate many of their issues, increasing the project costs as a result.

The federal EPA and state regulations (specifically Oregon, Washington and California) have established standards for effluent irrigation reuse and biosolids application for agricultural property to ensure human and animal safety. The City's proposal to use "Level II" effluent **fully meets**, and often exceeds, all of the regulatory standards and additional safety precautions. The City is using **treated effluent** only, not raw sewage, not biosolids, for agricultural irrigation on City owned land. Similarly, Class B biosolids used on the site for soil amendment, will meet or exceed all of the EPA and ODEQ standards for reuse. The City's treated effluent exceeds the regulations for recreational water contact. This land will have signs to inform people that reuse and effluent recycling operations are in place on site. Wind and other weather conditions will be constantly monitored to ensure there is no adverse wind drift or runoff of the effluent that is being applied on the site. There will be monitoring wells to ensure that there is no adverse impact to groundwater and wells. Significant exploration and evaluation of the site geology and soils became the basis for engineering design to ensure there would be no adverse impact.

Direct "apple-to-apple" comparisons of wastewater treatment plants are not easy. Most treatment plants are designed to operate and meet state permit standards based on effluent discharges to receiving waters/streams. Most larger cities and communities operate secondary treatment plants. In some cases, mostly for large cities, there are some tertiary treatment options. Tertiary plants add a third stage to their processing which includes either additional clarification or filtration based upon the desired outcome. Not all tertiary plants are the same. Few treatment plants have to meet the standards for phosphorous reduction established by DEQ for Ashland's WWTP. Medford's plant does not have to meet these standards given that they discharge to the Rogue River. There is a plant in the Willamette Valley operated by USA that is required to meet the 0.08 phosphorous limit. Most areas, including California, do not have the stringent in stream nutrient limitations that Ashland must meet.

Attached Information

1. Summary Table of Alternative System Costs
2. Staff Report Addressing Specific Questions from the March 2, 1999 meeting:
   - Quality of Treatment and Disinfection (Sludge/Biosolid Portion)
   - Level II and Level IV Effluent: Oregon and California Reuse Limits
   - Recreational Water Quality Standards
   - UV Capabilities to Meet Effluent Disinfection Requirements
   - Effluent Aerosol Effects
   - Landslide Potential and Geologic Implications
3. Carollo Engineers letter Dated March 23, 1999
4. Oregon Department of Environmental Quality Biosolids Program Summary (May 26, 1998)
5. Biosolids Recycling: Beneficial Technology For A Better Environment (EPA 832-R-94-009, June 1994)
6. Northwest Biosolids Management Association Biosolids Recycling Fact Sheets; "Environmental Effects" and "Agriculture" (both Rev. 7/97)
7. The Wenatchee World, October 5, 1997, "Don't Hold Your Nose" and related articles
8. California State Water Resources Control Board, Office of Water Recycling, Reclaimed Water Use in California, Draft Summary Sheet (Jan. 20, 1999)

Treatment Alternatives - Off Site Effluent and Biosolids Program
City of Ashland

capital cost total $8.6

Alt. #	Alternative Description note - ***bold*** reflects ***changes*** to the current project	Capital Cost	O&M plus Capital	Total Cost Increase (from #1)	Additional Rate Impact (see note **)	Comments
1	Continue with the Treatment Process for Level II Effluent and Continue with Biosolds Drying and Reuse on the Off-Site Property	$21,300,000	$31,596,000	$0	none	meets all safety, health and environmental standards and allows direct reuse of the treated effluent
2	Continue with the Treatment Process for Level II Effluent and ***Change the Biosolds Processing by Constructing New Digestion Facilities at the WWTP Site for Land Application at Approved Facilities (not specified at this time)***	$26,946,000	$39,741,000	$8,145,000	potential 50 - 55% rate increase	requires trucking of biosolids to various off-site land application sites (purchase of new truck not included in the O&M costs)
3	***Change the Effluent Treatment Process to Level IV Effluent*** and Continue with Biosolds Drying and Reuse on the Off-Site Property	$25,522,000	$36,773,000	$5,177,000	potential 30 - 35% rate increase	exceeds requirements for effluent reuse on agricultural property
4	***Change the Treatment Process to Level IV Effluent and Change the Biosolds Processing by Constructing New Digestion Facilities at the WWTP Site for Land Application at Approved Facilities (not specified at this time)***	$31,168,000	$44,917,000	$13,321,000	potential 85 - 90% rate increase	exceeds requirements for effluent reuse on agricultural property; requires trucking of biosolids to various off-site land application sites (purchase of new truck not included in the O&M costs)
5	***Change the Effluent Treatment Process to Allow Year Around Direct Discharge to the Creek and Biosolids Drying*** and Reuse on the Off-Site Property	$23,853,000	$33,441,000	$1,845,000	potential 10 - 13% rate increase	higher initial capital outlay, but over 20 years, O&M costs decrease for direct discharge to creek versus pumping and irrigating off site; may limit future water reuse options *would not lose water rights; but water rights would need to be used
6	***Change the Effluent Treatment Process to Allow Year Around Direct Discharge to the Creek and Change the Biosolds Processing by Constructing New Digestion Facilities at the WWTP Site for Land Application at Approved Facilities (not specified at this time)***	$28,434,000	$39,726,000	$8,130,000	potential 50 - 55% rate increase	requires trucking of biosolids to various off-site land application sites (purchase of new truck not included in the O&M costs); may limit future water reuse options
7	***Stop construction at the current site, abandon the existing treatment plant in total, connect to BCVSA and the Medford Regional Plant***	$29,803,000	$39,643,000	$8,047,000	potential 50 - 55% rate increase	does not support Council's decision to maintain reuse and recycling options of treated effluent; costs were not adjusted from 1995 figures

** Each additional $1,000,000 would convert to an additional $140,000 in debt service each year and would be equal to at 6.75% rate increase to satisfy the obligation.

ATTACHMENT #1

WWTP Discussion
Additional Background Information
Council Study Session
April 8, 1999

Each of the discussion topics mentioned in the Council Communication is outlined with more detail below.

Treatment / Disinfection (sludge/biosolid portion)
The Federal Water Pollution Control Act of 1972 (PL 92-500) added a new dimension for regulation of sewage treatment plants. The goal of the Act was "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" with the ultimate goal of zero discharge of pollutants into navigable, fishable and swimmable waters. Sewage sludge was initially regulated in 1979. Since then, the USEPA developed the microbiological quality standards for land disposal of biosolids. These standards are generally referred to as the "503 Rule" or sludge application rules. The actual regulation is in Section 40 of the Code of Federal Regulations (CFR) Part 503 Subpart D, *Standard for the Use or Disposal of Sewage Sludge*, initially promulgated in 1993. Two quality standards for sludge (now referred to as biosolids) are defined; Class A and B. Class A sludges are those that can be reused without restriction, and Class B places additional restrictions because there is a lesser treatment quality. Depending on the intended use of the processed sludge, communities can chose the disinfection quality.

The intent of a Class A sludge product is to disinfect and reduce the levels of pathogen organisims to below detectable levels for completely unrestricted use. Class A sludges can be sold or given away in bags for application to home gardens and other uses.

The intent of Class B sludge is to significantly reduce the pathogen levels and provide other precautionary measures so that there is no greater risk to the public, public health, and the environment than there is with a Class A sludge. Class B sludges rely on a combination of treatment and site restrictions to reduce pathogens. The site restriction prevent exposure to pathogens and rely on natural environmental processes to reduce pathogen levels to below detectable levels. These additional restrictions include restricting public access to the land applications site, controling animal grazing to certain periods, and preventing crop havesting for a period of time after application. In addition to pathogen reduction, a vector attraction reduction requirement must also be met when the sludges are to be land applied. The vector attraction reduction is imposed to reduce the potential for spreading infectious disease agents by vectors (which include flies, rodents, birds, etc.).

Again, it is important to understand the **intended use** of the biosolid/sludge product to define the necessary disinfection levels. Although Class A sludges are basically unrestricted, the Class B sludge is allowable and safe with extra precautions. Ashland is designing the biosolids treatment for a Class B sludge which is the appropriate level for the reuse site; a restricted agricultural site with adequate space to allow for the extra precautions. Class A sludge is not required for the agricultural use and beneficial soil amendment for the Ashland site.

ATTACHMENT #2

Level II and Level IV Effluent: Oregon and California Reuse Limits
Wastewater reclamation and reuse is not a new concept. More information is available from California's State Water Resources Control Board than from Oregon's DEQ. California has been steadily increasing it's water reuse operations for many years. Initial reuse regulations were promulgated in 1918 by the State of California. The City of Bakersfield has used reclaimed wastewater since 1912 for agricultural irrigation. In a study completed in 1987, California reported 854 distinct reuse areas using a total of 266,560 acre feet of water a year. By far, the largest use is agricultural irrigation at 63%, and the majority of the treatment plants serving water to reuse customers is on a small scale basis (86% are to those areas receiving less than 2500 acre feet per year. Reuse in California is encouraged as a means of using other than potable water for irrigation. A copy of the Draft Summary of "Reclaimed Water Use in California" as of January 20, 1999, is included as attachment 8 in this packet. California and Oregon are very similar in their classification of treated effluent for reuse. Reuse for pasture and farm irrigation requires a total coliform organism limit of 23 colonies per 100 ml. This is the same as Oregon's level II reuse water. California's additional restrictions for processed foods and reuse water are also the same as Oregon's limitations and restrictions. (Ref: California Municipal Wastewater Reclamation in 1987, California State Water Resources Control Board, Office of Water Recycling, June 1990)

The wastewater treatment plant in San Luis Obispo was referred to by name at the March 2, 1999 Council meeting. Staff contacted the Utilities Director and discussed the San Luis Obispo treatment operation. As suspected, San Luis Obispo does not have a phosphorous limit for discharging to their creeks. Although they provide a quality tertiary effluent, suitable for discharge to the creek, they have no nutrient limits in the waters. As previously discussed, not all "tertiary" treatments are alike and very few treatment plant are required to meet the phosphorus standard set by ODEQ for discharges into the Bear Creek system. San Luis Obispo chose a higher level of treatment (third stage to reduce turbidity levels) which required a significant initial capital improvement (over $30M) and requires an annual operating budget of $1.9 Million per year to operate plus an average of $200K additional capital improvements each year to maintain their state-of-the-art program.

Recreational Water Quality Standards
To determine bacteria levels and health standards, certain indicator organisms are used to identify possible contamination levels. Several indicator organisms are used including, total coliform, fecal coliform and E. coli. Their presence, in high amounts, indicates possible bacteria in the waters. Different levels are established to demonstrate acceptable limits for certain uses.

Per the DEQ 303d listing for water contact recreation, the bacterial fecal coliform limit is 200 colonies per 100/ml. Based on the City's NPDES permit for the wastewater effluent, our discharge limit to Ashland Creek is an in-stream standard based on E. coli and is a geometric mean of 126/100 ml and a max of 406/100ml. For comparison, Ashland Creek in Lithia Park has shown over 1500 fecal coliform colonies per 100 ml in the summer and although the data is sporadic, there have been numbers over 3900 (ref: RVCOG TMDL data 1995-1999).

Level II water is based on total coliform and is 23 organisms /100 ml on a seven day median and two consecutive samples cannot exceed 240 organisms per 100 ml. Currently, the WWTP is disinfecting from 20-150 total coliform at low levels of UV irradiation.

UV Capabilities to Meet Effluent Disinfection Requirements
Ultraviolet (UV) is produced by special UV lamps filled with mercury vapor charged by striking an electric arc. The energy released by the mercury vapor, as a result of the electric arc, produces UV light or UV radiation. The UV radiation damages the bacteria cells thereby providing disinfection in the wastewater. In Ashland's case the wastewater is treated through the oxidation ditch, through the secondary clarifier and then instead of going to the chlorine contact chamber for a two hour detention period, the water is forced through the UV chamber where it is exposed to the medium pressure UV lamps for 10 - 20 seconds. Because UV is not a chemical agent, no toxic residuals are produced and has no adverse environmental effects. There are currently two major manufacturers of medium UV systems for municipal wastewater systems; Aquionix and Trojan. After careful consideration and bidding process, we chose to utilize the Aquionix product. There are two types of UV disinfection technologies; low and medium pressure lamp systems. The medium pressure system has been in operation for over 10 years and generally produces 50 to 80 times higher germicidal UV output than the low pressure systems (ref: Wastewater Reclamation and Reuse, Takashi Asano, 1998).

Effluent Aerosol Effects
Pathogen levels in aerosols caused by spraying of wastewater is a function of their concentration in the applied wastewater and the aerosolization efficiencies of the spray process. In general, spray irrigation processes have a mean aerosolization efficiency of 1 percent. Bacteria and viruses have been found in aerosols emitted by spray irrigation systems using untreated or poorly treated wastewater (ref: Wastewater Reclamation and Reuse, Takashi Asano, 1998). Ashland's effluent will be highly treated and disinfected before being emitted through the spray irrigation nozzles. Wind increases the viability of air transport, but with the extended buffers and the ability to monitor and control each emitter head, the precautions have been significantly increased to protect human (and animal) health. Using spray nozzles with large orifices reduces the formation of fine aerosol mists. Setback buffers on the City's site are at a minimum 100 feet and in many cases are more than 300 feet from the property lines. Ashland's proposed operations exceeds current regulations as only a 70 foot buffer is required.

Landslide Potential and Geologic Implications
Much has been inferred about unstable soils and landslide potential on the site. Carollo Engineers hired Foundation Engineering, Inc. (November 1998) to conduct an extremely detailed soils and geotechnical evaluation for the City's reuse site. Their report indicated the presence of ancient faults and debris flow deposits, but no recent or active faults have been identified (Foundation Engineering, Inc., and D'Allura evaluations). These faults and debris flows were of the Pleistocene age, over 1.6 million years ago. There was a slump that occured immediately above the TID ditch after the January flood. In discussions with TID personnel, this occured as a result of transporting water during the Flood to the City of Talent. Normally the ditch does not transport water during the wet season. As the soils were saturated, the soils above the ditch started to slump. TID staff would periodically dig out the slump areas, and ultimately this section gave away. This does not indicate the presence of landslides, and does indicate that the water and soil saturation must be monitored for localized slope failures. The geotechinical report provided the basis for design of the reservoirs and lagoons. Their report indicated low potential for seismically induced liquifaction or landslides, and low probability of subsidence, lateral spreading and ground rupture due to faulting. Other localized disruptions must be monitored during construction.

Cost Comparisons
Council asked that various options be examined and costs re-evaluated. There are two components to the treatment plant; effluent (liquid portion), and biosolids (or solids portion). Each of the components are discussed below and a matrix was developed showing the various combinations available.

Effluent Alternatives: There are three alternatives for effluent reuse treatments:

Level II reclaimed water (current plan),
Level IV reclaimed water, and
Discharge to the creek on a year-around basis.

Level II Reclaimed Water. The Department of Environmental Quality (DEQ) has specific standards for different categories of treated effluent for reuse purposes (Oregon Administrative Rules Chapter 340, Division 55). Both Level II and Level IV require biological treatment and disinfection at the wastewater treatment plant. Level II effluent requires weekly sampling and a total coliform limit of no more than 23 organisms/colonies per 100 milliliters. The treatment plant currently under construction is designed to produce Level II reclaimed water. The assumption used for cost comparison is that no changes to either the designed offsite facilities or the WWTP improvements currently under construction would be required.

Level IV Reclaimed Water. Level IV effluent is not required for agricultural irrigation use. Level IV reuse water requires a higher level of disinfection and filtration. Level IV effluent for reuse purposes requires daily sampling and limits the total coliform to 2.2 organisms/colonies per 100 milliliters. Level IV use on agricultural land is less restrictive than Level II, however direct public contact is not allowed during the irrigation cycle, Level IV effluent cannot be applied where it can be sprayed onto food preparation areas, and signs must be posted indicating that the water is not suitable for drinking. Using Level IV water would change nothing on the offsite property. Level IV irrigation still requires the effluent storage ponds, pumps, effluent pipeline, and the irrigation system. Converting to Level IV water would require construction of additional filter units (Dynasand filter). Effluent from the secondary clarifiers would be pumped to a flocculation basin and then filtered using continuous backwash filters. Producing Level IV water will require additional annual operating costs. The filters and the flocculation basin would fit on the existing site, but would eliminate any future capacity on the site. Producing Level IV reuse water for City irrigation has merit for sometime in the future as indicated in the City's Comprehensive Water Master Plan. The costs shown for this Level IV option do not include costs for irrigation piping to other City properties.

Discharge to the Creek Year-Around. Discharge to the creek on a year-around basis requires additional treatment facilities and will make the plant considerably more complicated to operate. The additional treatment facilities are needed to meet DEQ's 0.08 mg/l phosphorus limitation established by the TMDL on Bear Creek, which is in effect from May through November. The 0.08 mg/l limit is extremely stringent and there are only a few treatment plants in the country capable of meeting that limit. For cost estimating purposes, it was assumed that an anaerobic selector would be constructed ahead of the aeration basin to provide biological phosphorus removal. Also, new alum and polymer handling and feed facilities and tertiary clarifiers/flocculators and tertiary filters (Dynasand) would also be constructed. Secondary effluent would be pumped to the tertiary clarifiers/flocculators and flow by gravity through the filters to the creek. This alternative is similar to the treatment at the wastewater treatment plant operated by Unified Sewerage Agency on the Tualatin River. Producing effluent that can be discharged directly to the creek year around, eliminates irrigation reuse.

Solids Handling Alternatives at the WWTP Site. The current proposal for the offsite property includes the storage, drying and land application of biosolids. If the property is not used for biosolids reuse, additional improvements will be required at the WWTP site. Three alternatives for handling biosolids at the treatment plant were evaluated. All three would produce a Class B biosolids product suitable for application to agricultural property. Alternatives to produce a Class A product were not evaluated. Thickened aerobic digestion was chosen as the best and most likely option to be used on the site, and was the basis for cost evaluation purposes. This option requires thickening, aerobic digestion, dewatering, storage, and hauling. To meet state and federal regulations, 60 days of aerobic digestion is required, and would necessitate the use of the existing aerobic digester plus the construction of a new aerobic digester with sufficient odor controls. The solids would be thickened prior to the aerobic digester to reduce the volume needed. Digested solids would be dewatered using a centrifuge or belt filter press and hauled by truck for land application similar to what is being done today. The proposed additional facilities would fit on the existing site but would not accommodate any future growth.

Abandoning the Existing System and Connecting to the Regional Facility: Costs estimates were requested for demolishing or abandoning in place the existing WWTP, sell the existing assets (land, equipment, etc), pay all current contracts (including the cost to break the contract) and connecting to the Medford Regional and BCVSA system. Without considerable extra staff and consultant time, the best cost estimates for this option are from the original Brown and Caldwell study showing a capital cost of $21,782,000, and a present worth cost of $30,623,000. The present worth cost has been adjusted from the 6% in the Brown and Caldwell study to 5% which is in use in the current present worth calculations shown on the attached sheet. Other than that, all of the calculations are based on the original Brown and Caldwell study, and may be a bit low. The "Regional" option includes building the pipe to the existing BCVSA line in Talent, and all systems development charges for the Medford Plant and the BCVSA system based on figures generated in January 1995. No inflation has been added. Potentially four City personnel would be laid off which has been included in the present worth calculations.

To date, $7,833,000 has been spent on design, construction management services, and construction of the on site process improvements. These costs are non-recoverable. There is approximately $1,020,000 of profit in the remainder of this $12,400,000 construction contract (15% of the remaining $6,800,000). Add an allowance for unrestockable inventory of $250,000. This bring the costs to $9,103,000. There is a maximum of $1,000,000 in potential salvage value of equipment at the plant. Although the existing treatment plant may be able to be sold and developed, it is assumed that considerable additional demolition and site clean-up would be required. The land value would be negligible.

There was an additional question as to whether or not the Medford plant would accept just the biosolids from Ashland. Initial conversations indicate that the Medford plant is "solids limited" and their current practice does not allow acceptance of sludge. As there was no positive response to this question, no further analysis was completed.

Cost Summary: The table attached to the Council Communication for the April 8th Study Session summarizes the costs for alternative reuse solutions. More detailed analysis and costs are shown in the attached letter from Carollo Engineers. This project is the largest capital improvement project the City has undertaken. The total capital cost is $21.5 Million, of which the City has a Clean Water State Revolving Fund loan from DEQ for $15 Million and has asked for another $5 Million. DEQ has indicated they have limited funding available and any additional requests would be difficult to support, especially for enhancements which exceed their requirements.

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RECEIVED
MAR 26 99
CITY OF ASHLAND

March, 23, 1999

Paula Brown
City of Ashland
20 East Main Street
Ashland, OR 97520-1814

Dear Paula:

At your request, we took a look at the extent and cost of the WWTP improvements if the off-site facilities were not built. Since there are concerns from the neighboring property owners about both the application of Level II effluent and biosolids on the site, and since there has been some discussion within the City of producing Level IV "unrestricted use" effluent, we looked at several treatment scenarios to assist the City in reevaluating their decision on the best treatment approach for Ashland's wastewater.

Table 1 summarizes our evaluation of the treatment scenarios available to the City. The scenarios presented within Table 1 all assume that the City will continue with established policy that Ashland should not be dependent upon the Medford Regional WWTP for wastewater treatment services. We will continue to look at the cost associated with sending biosolids to Medford for treatment. We have made inquiries with Medford and BCVSA but have not heard back on their charges for treatment and handling of the biosolids discharged into the BCVSA system.

Liquid Stream Alternatives

We looked at three alternatives for treating the effluent, Level II reclaimed water (current plan), Level IV reclaimed water, and discharge to the creek on a year-around basis.

Level II Reclaimed Water. As you are aware, the treatment plant under construction was designed to produce Level II reclaimed water. This water is suitable for a wide range of agricultural application but the state's rules do place some restrictions on its application. The assumption used for this analysis is that no changes to either the designed offsite facilities or the WWTP improvements currently under construction would be required.

Level IV Reclaimed Water. Level IV water is the highest quality reclaimed water allowed by Oregon's regulations. It's use on agricultural land is unrestricted and it can be used for a broader range of landscape irrigation throughout the City. It's use is not entirely unrestricted since direct public contact is still not allowed during the irrigation cycle, it cannot be applied where it can be sprayed onto food preparation areas, and signs must be posted indicating that the water is not suitable for drinking.

For purposes of this analysis we assumed that Level IV water would still require the use of the offsite property including the effluent storage ponds, the pumps, the effluent pipeline, and the irrigation system.

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SS 4/20/99 ATTACHMENT #3

At some point in the future, the City could build a distribution system to distribute Level IV reclaimed water throughout the City, but this would not eliminate the need for the proposed irrigation improvements on the City's agricultural property.

For cost estimating purposes it was assumed that the effluent from the secondary clarifiers would be pumped to a flocculation basin and then filtered using continuous backwash (Dynasand) filters. These filters have a lower cost than fixed bed filters and we have used them successfully at Napa Sanitation District and at Carson City, Nevada. The filters and the flocculation basin would fit on the existing site.

Discharge to the Creek Year-Around. Discharge to the creek on a year-around basis requires additional treatment facilities and will make the plant considerably more complicated to operate. The new facilities are needed to meet the 0.08 mg/l phosphorus limitation established by the TMDL on Bear Creek. That limitation is in effect from May through November. The 0.08 mg/l limit is extremely stringent and there are only a few treatment plants in the country capable of meeting that limit.

For cost estimating purposes, it was assumed that the WWTP improvements, in addition to what is currently being constructed, would include an anaerobic selector in front of the aeration basin to provide biological phosphorus removal, alum and polymer handling and feed facilities, tertiary clarifiers/flocculators and tertiary filters (Dynasand). Secondary effluent would be pumped to the tertiary clarifiers/flocculators and flow by gravity through the filters to the creek. The proposed facilities for this alternative are consistent with the treatment approach taken at Unified Sewerage Agency on the Tualatin River.

The additional facilities would fit on the existing plant site.

Solids Handling Alternatives

As you are aware, the offsite property is proposed for the storage, drying and application of biosolids. If the property is not used for biosolids, additional improvements will be required at the WWTP site. We looked at three alternatives for handling biosolids at the treatment plant. All three produce a Class B biosolids product suitable for application to agricultural property. We did not evaluate alternatives that produce a Class A product. The three solids handling alternatives we evaluated are:

- Thickening, aerobic digestion, dewatering, storage, and hauling. To meet state and federal regulations, 60 days of aerobic digestion is required. This would require the use of the existing aerobic digester plus the construction of a new aerobic digester. We assumed the new aerobic digester would be covered and odor control would be installed. The solids would be thickened prior to the aerobic digester to reduce the digester volume needed. Digested solids would be dewatered using a centrifuge or belt filter press and hauled by truck for land application. Since the City can not consistently apply to farmer's fields on a year-around basis, we also included cake storage.

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- Thickening, anaerobic digestion, dewatering, storage, and hauling. This alternative utilizes an anaerobic process to provide stabilization. The plant is currently providing anaerobic digestion but the digester is not of adequate size. This alternative would be more expensive than aerobic digestion and is not typically used on sludges from extended air activated sludge processes.

- Dewatering and lime stabilization. Dry lime is added directly to the cake after it is dewatered. The treated cake would be transported in a screw conveyor to a cake storage facility, where it would be allowed to sit for at least 24 hours to achieve the required contact time at high pH. An odor control system would handle exhaust from the dewatering/lime dosing building. This alternative has a lower capital cost than the aerobic digestion alternative and has the potential to save the City money. Because of the lime, the biosolids have a different, alkaline character. The local need for alkaline biosolids should be evaluated during predesign should the decision be made to keep all of the biosolids facilities on the WWTP site.

For cost estimating purposes it was assumed that the aerobic digestion alternative would be constructed at the WWTP site. The proposed facilities would fit on the existing site.

Table 1 summarizes the options available to the City to meet the discharge requirements established by DEQ and to produce a Class B biosolids product. More detailed cost breakdowns are shown in the attachments.

From the cost information presented in Table 1 it can be concluded that it would make little sense, from a cost perspective, to produce Level IV water and use it to irrigate the city's agricultural property. This alternative would require more treatment facilities at the treatment plant and still require the effluent pumping, storage, and irrigation system on the offsite property. If the City chooses to abandon the offsite property for use in recycling biosolids and effluent, the next lowest cost option is to discharge to the creek on a year-around basis.

We hope this information helps the City in reevaluating their options. We have supplemental information on the assumptions that went into each alternative and would be happy to present that information to you in more detail.

Very truly yours,

CAROLLO ENGINEERS, P.C.

Robert B. Eimstad, P.E.
Principal

Attachments

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Table 1 Treatment Alternatives
City of Ashland

Alt. #	Liquid Stream Treatment			Solids Treatment		Capital Cost	Present Worth Cost
	Level II (Existing)	Level IV Water	Discharge Year Around	Existing Scheme	@ WWTP Site	$1,000	$1,000
1	■			■		8,600	12,896
2	■				■	14,246	21,041
3		■		■		12,822	18,073
4		■			■	18,468	26,217
5			■	■		11,153	14,741
6			■		■	15,734	21,026

Oregon Department of Environmental Quality
Biosolids Program Summary

INTRODUCTION

The Department of Environmental Quality (DEQ) is pursuing delegation of a partial program for the regulation of biosolids, municipal sewage sludge, biosolids compost or other EQ products, and domestic septage. The program covers treatment and land application of biosolids and domestic septage, and the distribution and marketing of biosolids derived products. The program does not cover incineration or surface disposal of sewage sludge or biosolids. The existing administrative structure in the DEQ Water Quality Division offers a sound basis for Oregon to beneficially use all of its biosolids, continuing more than 25 years of promoting biosolids beneficial use through land application.

BIOSOLIDS PRODUCTS

Annual production of biosolids in Oregon is ~60,000 dry tons. Composted biosolids is about 8% of this amount, or ~4,800 dry tons. Surface spreading of Class B liquid biosolids from tank trucks or field irrigation sprayers are the most common application methods used. Large sources typically apply Class B dewatered cake biosolids with conventional manure spreaders or specialized spreading equipment. The use of lime stabilized biosolids is increasing, especially at smaller aerobic digestion facilities.

State standards are more specific than the federal regulations in a few key ways. These differences include the need for all septage to be alkaline stabilized prior to land application; setting a minimum 50 foot setback from all water bodies for land application of bulk Class B biosolids; requiring odors to be managed on a case-by-case basis; and requiring both biosolids management plans and site authorization letters prior to land application. Also, any sites that receive biosolids year after year are required to have a soils test for residual nitrate nitrogen prior to the third annual application.

BIOSOLIDS MANAGEMENT SYSTEM

Oregon DEQ uses a three tiered system of permits, plans, and site authorizations to regulate the generation, treatment, storage, transport, and land application of biosolids and domestic septage. All permittees must operate their solids handling programs according to DEQ approved biosolids management plans, which are considered extensions of their permits. All land application sites require DEQ written site authorizations, which are also considered extensions of the source permits, through their biosolids management plans.

The DEQ Water Quality Program is responsible for all biosolids permitting, including facilities producing composts made with biosolids.

PERMITS

The DEQ works directly with permitted sources to craft WQ permits appropriate for each facility, reviewing and approving biosolids management plans, and authorizing sites for land application. Permit conditions include relevant federal [40 CFR Part 503] and state [Chapter 340 Division 50 OAR] rule requirements.

In DEQ regional offices, permit coordinators track the progress of permits from application through final permit issuance, and manage the mailing lists used to inform other agencies, the interested public, and newspapers about permitting activities. Mailing lists are large and cover all major newspapers in the state, as well as many organizations and interested people. Permit writers are also responsible for facility and site inspections, review of discharge monitoring reports, operator education and training, review of plans and annual reports, and enforcement referrals.

The permit application requires preparing or updating a biosolids management plan, which includes available land application site information and site selection criteria for new sites. In some cases, new state biosolids requirements have led to compliance schedules being included in new permits, with a date scheduled to submit revised biosolids management plans.

The permitting process includes:

- the preparation of a draft permit and fact sheet;
- applicant review;
- public notice of the draft permit with public notice;
- addressing all comments received; and
- issuing the permit with public notice.

Appeals of permits must be made within 20 days to the DEQ. Permit appeals are scheduled for hearing before the Environmental Quality Commission (EQC), DEQ's oversight authority. Subsequently, EQC decisions can be appealed to the courts.

MANAGEMENT PLANS

Biosolids management plans help assure that biosolids are well managed and beneficially used in a manner which protects the public health and the environment, and have been required by rule since 1984.

These plans are subject to public review as part of the permitting process and are considered enforceable extensions of a source's permit.

Biosolids Management Plans address:

- solids stabilization processes;
- biosolids quality;
- annual solids production;
- solids storage capability;
- solids transportation;
- spill contingency options;
- biosolids land application site characteristics and site selection criteria;
- annual and long-term loading rates; and
- crop fertilizer and site management requirements.

Septage Management Plans approved under either a septage handling license or a WPCF permit (for land application), address the kinds and quantities of septage materials collected by the company, the kind of pumping, transport, mixing, and storage equipment used, and the disposal or beneficial use sites authorized for disposition of the collected septage.

Any deviations from the management plans or use of the pumping equipment for materials other than domestic septage must be requested in writing in advance and must be authorized in writing by DEQ regional staff prior to such use. DEQ is attempting to improve conformance to these requirements through the license renewal process.

SITE AUTHORIZATIONS

Biosolids rules require sources who desire to land apply bulk Class B biosolids or septage to obtain advance written DEQ authorization for each proposed site. Sites are authorized by DEQ regional staff after a field visit, once site qualities have been reviewed based on soil surveys and maps, and only after local land use approval. Site management requirements are detailed in specific authorization letters, and approval conditions are considered permit requirements.

In the past six years, DEQ regional staff authorized biosolids land application on more than 26,500 acres at more than 500 sites. Currently the total DEQ authorized biosolids land application site acreage is over 37,000 acres.

Buffer areas required between biosolids land application areas and site features are adjusted to recognize:

- the extent of biosolids processing at a wastewater treatment facility;
- the equipment used to apply biosolids;
- the moisture content of the biosolids;
- the soils and planned crop;
- topography and landscape position;
- surrounding land uses;
- climate and wind; and
- vegetation density surrounding the area to be amended with solids.

TRAINING, UNIVERSITY ASSISTANCE & REGIONAL NETWORKS

The DEQ emphasizes continual training of treatment plant staff to aid compliance. Annual operator short schools and technical assistance visits are used to provide training to both operators and management staff. Regional biosolids field staff and the DEQ state coordinator also meet regularly to discuss implementation issues and improve program understanding, efficiency and statewide consistency.

Oregon State University (OSU) assists in implementing the program with their research programs and information from local extension specialists on soils, nutrients and crop management. OSU soil scientists have also collaborated with DEQ, the Oregon Association of Clean Water Agencies (ACWA), and the Northwest Biosolids Management Association

(NBMA) to produce guidance, informational documents, and training on the land application of biosolids. Regional research and training activities are promoted whenever possible.

DOMESTIC BIOSOLIDS TECHNICAL ADVISORY COMMITTEE

The DEQ receives ongoing advice from the Domestic Biosolids Technical Advisory Committee (BTAC), which has existed since 1989 as a standing committee to assist with making overall program refinements, drafting policies, and revising rules and guidelines for EQC consideration. The Committee played a central role in policy development while the state rule was revised after Part 503 was issued.

BIOSOLIDS PROGRAM RESOURCES

Currently, DEQ has ~3.1 FTE to implement the biosolids program in Oregon. This staffing total reflects full use of Annual Compliance Determination Fees collected for biosolids. No new state resources are envisioned for the implementation of the delegated federal program, unless there are increased fees.

Table 1 -Staff Positions and Duties

FTE	Position Types	Responsibilities
1.0	Program Coordinator	Program, rule & policy development; statute & rule interpretation; program coordination; database management; public information; assist with plan review & approval; liaison to state & regional organizations representing regulated municipalities.
2.0	Regional Biosolids Staff	Program implementation; permit development; facility and site inspection; site authorization; compliance & enforcement determination; public information; rule interpretation; plan review & approval.
0.05	Regional Permit Writers & Inspectors	Permit development; facility inspection; compliance & enforcement determination.
0.05	Regional Permit Coordinators & Managers	Permit processing & coordination including public notification. Management of staff; budget & policy decisions.

Table 2 - Biosolids Funding and FTEs

Staff by Region	Position Classifications	FTE (estimate)	Position Cost * (estimate)
State Coordinator	NRS 4	1.00	$ 81,108
NWR	NRS 3	0.90	$ 63,172
WR - Salem	NRS 4 & EE 2	0.30	$ 22,642
WR - Roseburg	NRS 3	0.30	$ 21,057
ER - Bend	NRS 3	0.10	$ 7,019
ER - Pendleton	NRS 3 & EE 2	0.20	$ 14,379
other regional staff	NRS 3	0.20	$ 14,038
regional management & administration	averaged	0.10	$ 7,019
	TOTALS:	**3.10 FTE**	**$230,434**

Full cost figures represent maximum annual salary of each position class, multiplied by fringe benefits + overhead [@ ~62%],
plus services and supplies [@ $1,000 per FTE],
multiplied by the estimated percentage of time spent on biosolids activities.
NOTE: Projected 1998 salary increase of 5% is not included.

Total Fee Funding $231,915 (from Annual Compliance Determination Fees)
Total Salaries $230,434 (estimated)

ENFORCEMENT

Compliance assurance involves all of the program elements described, plus a credible enforcement response when needed to correct rule violations. Enforcement is intended to prevent environmental harm and to ensure a level "playing field" for all biosolids sources. DEQ is not able to inspect every site, or even every facility, every year. DEQ relies on the general public for information referrals on potential management problems such as odors, runoff, or other problems.

Two recent examples of DEQ biosolids enforcement actions included fines for:

- the negligent spray application of biosolids that entered surface water; and
- failure to develop a biosolids management plan, coupled with over application of biosolids and no crop removal, which together presented a threat of nitrate leaching to groundwater.

Biosolids Recycling: Beneficial Technology For A Better Environment

EPA 832-R-94-009
June 1994

Overview

- The U.S. Environmental Protection Agency (EPA) will continue to promote practices that provide for the beneficial use of municipal biosolids, while maintaining or improving environmental quality and protecting human health.

- Thousands of municipalities are currently land applying or otherwise recycling their biosolids. Both agricultural and non-agricultural sites benefit from the nutrient and soil conditioning value of biosolids, which is generally worth about $100 to $140 per agricultural application of biosolids. Biosolids have been used successfully in the production of many different food, feed, and horticultural crops; in the production of sod and the maintenance of turf; for improved forest productivity; and for reclaiming and vegetating areas disturbed by mining, construction, and waste disposal activities.

- EPA continues to provide guidance and rules for the safe use of biosolids. Its current rule for the final use or disposal of biosolids (40 CFR part 503) is the result of nearly 10 years of intensive study and development. This process involved detailed scientific risk assessment with careful evaluation of the available data, the use of improved model and more realistic assumptions. It benefited greatly by the extensive assistance of biosolids experts.

- The biosolids now being generated are for the most part low in pollutants, rich in nutrients and organic matter, and highly suitable for recycling as a result to EPA's clean water and pretreatment efforts. The Part 503 standards provide for a wide range of different end-use possibilities for these biosolids.

ATTACHMENT #C

EPA Policy on Beneficial Use of Municipal Biosolids

EPA's "Policy on Municipal Sewage Sludge (Biosolids) Management" (49 Federal Register 24358 June 12, 1984) states that:

> "The U.S. Environmental protection Agency (EPA) will actively promote those municipal biosolids management practices that provide for the beneficial use of biosolids while maintaining or improving environmental quality and protecting the public health. To implement this policy, EPA will continue to issue regulations that protect public health and other environmental values. Local communities will remain responsible for choosing among alternative programs; for planning, construction, and operating facilities to meet their needs; and for ensuring continuing availability of adequate and acceptable disposal or use capacity."

As noted in the policy statement, EPA prefers well-managed practices that beneficially use municipal biosolids. Such practices include land application of biosolids as a soil amendment or fertilizer supplement and various procedures that derive energy from biosolids or convert them to useful products. These practices can help reduce the volume of biosolids requiring disposal, thus reducing the rate at which the limited capacity of disposal facilities is exhausted. Other benefits derived from recycling biosolids include improved soil fertility and tilth, reduced need for and enhanced response to inorganic fertilizers, better growth and quality of crops, and decreased consumption of energy.

Biosolids Are A Natural Fertilizer

For many individuals, biosolids induce major emotional response. This response is understandable when you realize that ever since infancy, parents teach children that human waste is dirty and is to be avoided and flushed down the toilet. Compare this with the life-long experience of most persons familiar with animal waste as a material to be managed and used.

Like animal waste, biosolids are a part of the natural cycle of life. They consist of organic compounds removed during wastewater treatment. An important perspective on biosolids, the natural fertilizer, can be gained from the following closer look:

> "Crops that supply our food and animal feed are grown in the soil. To grow, the crops need fertilizer and water. Essential soil fertilizer nutrients include carbon, hydrogen, oxygen, phosphorus, potassium, nitrogen, sulphur, calcium, iron, magnesium, molybdenum, boron, copper and zinc. Plants take up these essential soil-borne nutrients that are necessary for their normal growth. Using these nutrients and sunlight, plants manufacture organic carbon-rich foodstuffs such as carbohydrates.
>
> "The same nutrients that are essential for plant growth also are essential for the growth of humans and other animals. We gain many of these essential nutrients, along with carbohydrates, fates, and proteins, by eating plants. Wastes the are excreted from humans and contain <u>these</u>

same essential nutrient elements that are in the foods we consume. These wastes go into the municipal wastewater system along with other household wastes. Municipalities also collect and wastewater from industrial and commercial sources. The residual solids generated during wastewater treatment were previously called sewage sludge. Sewage sludges that can be used are now being called biosolids to emphasize the beneficial nature of this valuable recyclable resource. Properly prepared biosolids provided a rich source of the essential fertilizer elements needed by plants to produce food. It seems only natural to return this rich source of nutrient and organic matter to the soil to perpetuate the cycle of life."

Appropriate control is needed for the safe agricultural use of all fertilizers and soil conditioners, whether in the form of biosolids, other organic amendments, or chemically based fertilizers, to insure that the proper amount of essential elements are provided. Controls also are needed with all fertilizers and soil conditions to avoid contamination of groundwater with leachable excess nitrogen. Controls are needed with biosolids and animal waste, because, depending upon the level of treatment, disease-causing organisms (pathogens) may be present and vectors such as flies and rodents can be attracted that may transmit disease. These controls come from many sources. Some control comes from following State fertilizer recommendations and sound agricultural practices. Additional control is obtained by requiring wastewater treatment to reduce pathogens to levels that are not harmful. Pretreatment by industry, mandated by law, is another primary control that prevents excessive levels of unwanted pollutants in wastewater and the resultant biosolids. Pretreatment and source control have been very successful in reducing the levels of pollutants in biosolids. And finally, compliance with the new Federal as well as existing State regulations requires the careful implementation of management practices and the use of biosolids application rates based on crop needs.

Agricultural Use of Biosolids

EPA's policy that promotes the beneficial use of municipal biosolids is based on years of extensive study and experience. Hundreds of studies have been conducted as a basis for the safe use of biosolids. Moreover, thousands of publicly owned treatment works (POTWs) are currently using their biosolids as an organic fertilizer and soil conditioner on land throughout the United States. For example, over 99% and 90%, respectively, of all biosolids produced in Oregon and Maryland are used on the land.

Examples of communities recycling their biosolids include Hannibal, MO (population 19,000), Madison, WI (250,000 population), and Seattle, WA (1.1 million population). Each of these municipal authorities have been winners in EPA's National Beneficial Use of Biosolids Awards Program. Hannibal MO and Madison, WI charge farmers for using their biosolids. Hannibal recovers 100% of the costs of hauling and spreading biosolids from its sales to farmers. Madison receives $12 per acre for applying their biosolids. Madison fertilizes 3,000 to 4,000 acres of farmland with biosolids each year and has farmers waiting with a total of 22,000 acres of farmland available for application. Seattle applies biosolids to forest as well as agricultural land.

Since 1974, all biosolids from metropolitan Washington, DC (3 million population) have been used on land. In 1993 about 75% (87,000 dry tons) of dewatered biosolids produced was used on agricultural land in Maryland (4,000 acres) and Virginia (4,000 acres). The remaining 25% was composted for use by landscapers, horticulturalists, and the general public. The dewatered biosolids were applied to private farmland by private contractors at no charge to the farmers. The farmers received \$100 to \$140 worth of needed nitrogen, phosphorus, trace nutrients, lime and organic matter per acre from each 5 to 10 ton per acre application of biosolids.

Table 1. Value of 5 to 10 dry tons per Acre of Typical Dewatered Anaerobically Digested Biosolids

Nutrient	Lbs/Ac Applied	Value/Ac (\$)
Nitrogen	150	30
Phosphorus (P_2O_5)	150	30
Potassium (K_2O)	10	1
Copper	7	14
Zinc	10	12.50
Sulfur	20	10
Lime	1 ton	28
Spreading		15
Total Value*		\$140

*Value of organic matter is in addition to this total

An additional benefit of biosolids is its suppression of pathogenic soil organisms such as nematodes that damage plant roots as well as specific plant root diseases that otherwise cause damage to commercially grown potted plants.

Non-Agricultural Use of Biosolids

The beneficial uses of biosolids are not limited to farmland application. Biosolids are used in silvicultural to increase forest productivity and to revegetate and stabilize lands that have been harvested or disturbed by mining, construction, fires, land slides, or other natural disasters.

The application to forest land can shorten pulp wood and lumber production cycles by accelerating tree growth, especially on marginally productive soils. Studies by the University of Washington and the U.S. Forest Service in the Southeast, on the use of biosolids as a fertilizer in silviculture have shown as much as a three-fold increase in tree growth compared to controls for certain tree species.

Biosolids are used productively to stabilize and revegetate areas destroyed by mining, dredging, and construction activities. Alkaline-stabilized, digested, air-dried and composted biosolids are frequently used to help revegetate mine spoil, highway embankments and median strips and other construction sites.

Alkaline-stabilized biosolids are also used as a soil substitute for intermediate and final landfill cover. The use of biosolids in land reclamation efforts has proved very successful and comparable in cost to commercial methods in both large-and small-scale projects. For example, in a strip-mined area in Fulton County, IL, reclamation using municipal biosolids costs about $3,700 per acre, as compared with a range of $3,400 to $6,300 per acre using commercial methods.

Studies in New Mexico have shown sustained improved growth and nutritional quality of desirable native vegetation on rangeland and reduced run-off of rain water from a one-time, 10 to 20 dry tons per acre surface application of biosolids. Studies in Colorado, with 1 to 15 dry tons per acre of biosolids applied, are being conducted to determine optimum rates to improve range quality and minimize public health and environmental risks. Early results from these studies show similar improvements in range quality and reduced water run-off proportional to the rate of biosolids application.

Biosolids have been used to reclaim over 3,000 acres of lands devegetated by mining and smelting activities in Pennsylvania. Biosolids are being used in combination with fly ash to revegetate soils at a Palmerton, PA, site which has been included on EPA's list of Superfund sites. The Palmerton site was so highly contaminated from 90 years of smelting zinc that all vegetation in the surrounding area was destroyed. The research team members from Allentown, PA, and the Pennsylvania State University, who were responsible for demonstrating the viability of the reclamation procedures, were recognized as winners in EPA's first National Beneficial Use of Biosolids Awards Program (1988).

Biosolids Recycling: Practices and Benefits

Biosolids may be used separately or in conjunction with chemical fertilizers. Particularly in soils that are low in organic matter, biosolids provide benefits that are not available from chemical fertilization. The biosolids' organic matter enhances the soil rooting media thus providing for better water retention, improved air exchange around plant roots, and increased ability of the soil to hold nutrients in a plant-available state (increased cation exchange capacity). In sandy, highly leachable soils, the tendency for biosolids' organic nitrogen to be released at a rate that is consistent with plant uptake, mitigates the loss of excess nitrogen into groundwater.

The biosolids' organic matter had impacts on Yuma, AZ farmland that initially might have seemed undesirable. Herbicides became less effective because of their interaction with the changing sandy soil and organic biosolids matrix. Those fields, previously weed-free, now contained more weeds. On the other hand, the plant became more vigorous and better able to compete with weeds and withstand damage from insect pests. The changes that occurred because of biosolids usage allowed the farmer to decrease his costs for fertilizer, herbicides and pesticides by approximately $170 on each acre of his 12,000 acre farm.

In some instances the total yield decreased compared to weed-free fields. However, the farmer's net return per acre increased (more dollars per acre profit). The same Yuma, AZ farmer, because of his enhanced yield and lowered costs from use of biosolids, decided to dedicate 10% of his land each year to producing grains for wildlife. Because of the farming changes that left more cover from weeds on all 12,000 acres and the 1,200 acres left each year with unharvested grain for wildlife, the dove and other wildlife population increased so substantially in 6 years that the Yuma region began to realize an unexpected $3.5 million increased annual benefit from hunting related activities..

Other Uses for Biosolids

The sale of biosolids products to the public for many kinds of garden, nursery, household, and lawn uses continues to increase. Treatment such as heat-drying, composting, and treatment with alkaline materials, converts biosolids into useful products that can be considered "exceptional quality" if pollutant concentrations in the biosolids do not exceed the minimal levels specified in Table 3 of the Part 503 Regulation. These products are safe for unrestricted use by the general public. Generators of these products are required to have an ongoing monitoring program to ensure that the biosolids continually meet the "exceptional quality" requirements.

Examples of these stabilized products include Milwaukee's heat-dried product "MILORGANITE", which has been produced and sold throughout the United States since the 1920's. Products of this nature have sold in bulk for as much as $190 per dry ton if high in nitrogen content and aesthetically pleasing. Kellogg Supply Company (a private California firm) has been producing and marketing composted biosolids products (e.g., NITROHUMUS, TOPPER, GRO-MULCH) mostly in California, Arizona, and Nevada, for a similar period of time. Their products include composted biosolids that have come predominantly from Los Angeles, County, California, wastewater treatment facilities. Both MILORGANITE and NITROHUMUS have been used to establish and maintain grass playing fields in sports stadiums across the country--including the Rose Bowl. A composted biosolids product from Philadelphia called EARTHGRO has been used with great success for growing container plants and chrysanthemums. Even the White House has used composted biosolids to reestablish lawns. Several years ago, 825 tons of composted biosolids (COMPRO) were used in this highly successful project. Similarly, the lawns at Mount Vernon, the Washington Monument Grounds and the Governor's mansion in Annapolis, MD, were renewed with COMPRO. The first use of composted biosolids on the Washington, DC Mall (nearly 6,000 dry tons) was in 1976 to establish Constitution Gardens in time for the United States Bicentennial Birthday celebration. COMPRO is currently being sold for $10 to $50 per cubic yard in bulk depending on quantity of delivery. The cost of their bagged product is $5 to $6 per cubic foot.

Current research by Heneghan, et. al. regarding the potential use of biosolids to remediate soils containing high levels of lead by reducing the soil lead bioavailability shows promise. The research is indicating that appropriately produced and applied biosolids may help protect child health because the biosolids matrix reacts with the lead in contaminated soils to reduce the bioavailability of the soil lead. The research involved the feeding of laboratory animals an otherwise completely balanced diet that also contained 9% of either a low or high-lead containing urban soil mixed with 1% of different biosolids products.

The preliminary results from these animal feeding studies show up to 50% reduced bioavailability of ingested lead, (i.e., reduced absorption of ingested soil lead into the blood and body tissues reflected by bone levels). Such data suggest that children ingesting biosolids-treated soil and dust may have a decreased absorption of lead into the blood stream, thus lessening the potential for lead-induced nerve and brain damage. Additional research is needed with laboratory animals to determine the best form of biosolids to use and the reduction of bioavailability that is possible.

Another stabilization method that is commonly used by many wastewater treatment works in anaerobic digestion. This stabilization process generally yields a Class B biosolids product as defined in EPA's Part 503 Regulation that has been spread for years on agricultural land in liquid form and is a dewatered product. One of the most economical and agriculturally beneficial methods for using biosolids is the land application of this type of stabilized product.

Methane gas is generated during the anaerobic digestion process and has considerable value. For example, the Tampa, FL, treatment works recovers about $700,000 worth of electricity each year from methane it produces during anaerobic digestion. This is equivalent to approximately $65 worth of net electricity being produced for every ton of volatile biosolids removed from the digester. Tampa also uses heat removed from the electrical generators to provide more than 95% of the warmth needed for the digesters. All but 10 to 15% of Tampa's anaerobically digested biosolids are being heat-dried and marketed for between $85 to $120 per dry ton. The balance is being land applied in dewatered form. Tampa was recognized for this highly efficient operation in EPA's 1993 Beneficial Use Biosolids Awards Program.

Expert Opinions Regarding Biosolids Useability

In 1981, Del Monte Corporation, along with other food processors, announced that they would no longer accept fruit and vegetables for processing that have been grown on biosolids treated soils. Officials from the U.S. Department of Agriculture (USDA), the Food and Drug Administration (FDA), and EPA met with representatives of the National Food Processors Association to address food processor's concerns.

After analyzing the available health and safety information pertaining to these practices, the USDA, FDA, and EPA issued guidance and a joint policy statement in 1981 that was signed by the Administrators of each Agency. The Agencies endorsed using biosolids on land for producing fruits and vegetables, and concluded:

> "that the use of high quality biosolids, coupled with proper management procedures, should safeguard the consumer from contaminated crops, minimize any potential adverse effect on the environment," and "that, with the adherence to the guidance contained in this document, the safety and wholesomeness of the fruit and vegetable crops grown on biosolids amended soils will be assured."

In 1983, over 200 health and environmental experts from the United States, Canada, and Europe met in Denver, CO, to assess the state of the art for biosolids use and disposal (ten years after a similar meeting in Champaign, IL). These experts arrived at a published consensus that the existing guidance and regulations were adequately protective of public health and the environment, provided that biosolids were used in accordance with those provisions. They concluded:

> "Guidelines have been developed to enable the environmentally safe use of biosolids containing median concentrations of metals and organics when the biosolids are applied at agronomic rates based upon nitrogen or phosphorus utilization by crops"
>
> "Groundwater monitoring for nitrate-nitrogen is not needed where biosolids nitrogen additions do not exceed fertilizer nitrogen recommendations for the crop grown."
>
> "Using biosolids for reclamation of disturbed land at rates higher than those for agricultural land, when properly implemented and managed, improves the quality of soils, groundwater or vegetation."
>
> "With proper management and safety allowances based on research data, land application is a safe beneficial and acceptable alternative for treatment of municipal wastewater and biosolids."

Some concern has been expressed about the possibility that land-applied biosolids might damage crops, livestock, or the land itself resulting in possible financial loss to the farmer or his mortgage lender. Some concern has also been expressed about possible future loss that might occur if new discoveries were to show anticipated hazards from previous biosolids use.

While there can be no guarantees, past experiences with agronomic use of biosolids have been very reassuring. Where biosolids have been applied in accordance with regulations, problems that have occurred are rare and generally related to inadequate field management and not biosolids quality--virtually the same type of problems which have occurred from other normal farming practices. All research to date leads to the conclusion that the agronomic use of high quality biosolids is sustainable and very safe.

BIOSOLIDS RECYCLING fact sheet

NORTHWEST
BIOSOLIDS
MANAGEMENT
ASSOCIATION

ENVIRONMENTAL EFFECTS

Long-term scientific studies have consistently demonstrated that biosolids recycling is safe and beneficial when performed in accordance with federal regulations and guidance.

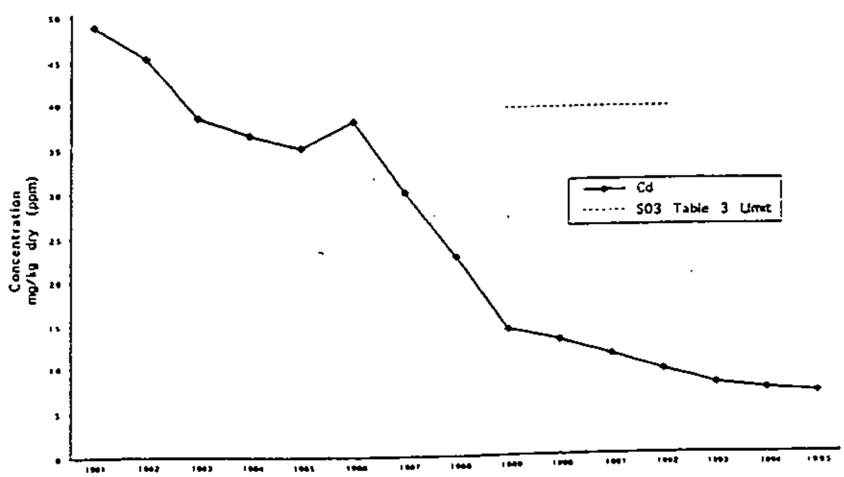
How Much Do We Know?

The management of biosolids to minimize environmental and health risks has been the focus of hundreds of university research studies conducted for many years. The results of this extensive research show that biosolids can be managed so that the risk of adverse effects to the environment or public health from land application of biosolids is extremely low.

To ensure that biosolids are treated and appropriately managed, the United States Congress directed the U.S. Environmental Protection Agency (EPA) to develop comprehensive national standards to reduce the risks and maximize the benefits of land application of biosolids. In February of 1993, EPA issued its biosolids use and disposal regulation, 40 CFR Part 503, commonly referred to as "Part 503." This regulation addresses the following:

Metals

A small amount of metals such as cadmium, lead, copper and zinc can enter wastewater from industrial drains, from homes and from metal pipes. These metal pollutants remain in the solids throughout the treatment process. When biosolids are applied to the land, the metals cling to soil particles and organic matter and do not move down into the groundwater. Metals occur naturally in the soil and many metals are actually plant micronutrients. The amount of metals in biosolids is carefully regulated and monitored.



Trend in Annual Average Cadmium Concentration* from 1981 through 1995 for King County's West Point Treatment Plant Dewatered Biosolids

* Represents a statistically significant drop in average concentration

• *Government limits:* In order to protect human health and the environment, the Environmental Protection Agency (EPA) sets limits on the amount of trace metals allowed in biosolids. These levels are based on more than 20 years of research on how trace metals affect soils, plants and animals.

• *Pretreatment requirements:* Rigorous "pretreatment" programs control the amount of metals entering wastewater treatment plants. Laws regulate industries to make sure that they dispose of their chemicals safely. This means that metals are removed from the waste stream before they ever reach the sewer. This ensures that biosolids contain metals only in small quantities.

• *Biosolids quality:* Biosolids are routinely tested for metal concentrations to make sure that they comply with all regulatory requirements. Biosolids in the Pacific Northwest typically meet the strictest requirements set by the Environmental Protection Agency.

Pathogens

Before treatment, wastewater may contain disease-causing microscopic organisms, such as bacteria and viruses, which are known as pathogens, or germs.

• *Federal law requires treatment to reduce pathogens:* Digesters and other forms of treatment kill at least 90 percent of the pathogens originally found in wastewater solids. Additional treatment by heating or composting is required to eliminate pathogens in biosolids used in home gardens and landscapes.

• *The cleaning process:* Conditions such as exposure to sunlight, lack of moisture or a relatively harsh soil environment destroy the few remaining pathogens that may exist in biosolids soon after they are applied to the land.

Excess Nitrogen

Biosolids contain organic and inorganic nitrogen and can be applied to plants as a fertilizer to dramatically accelerate growth. However, the addition of too much nitrogen, whether from biosolids or from a commercial fertilizer, can be detrimental to plant growth or can degrade groundwater or surface water.

Sites receiving biosolids applications are carefully selected and managed to ensure the protection of water resources. Farmers and foresters consider plant needs and soil nutrient levels when applying biosolids to their crops and trees, providing only as much nitrogen as the plants can utilize.

Trace Synthetic Organics

Biosolids contain minute concentrations of certain regulated organic compounds including polycyclic aromatic hydrocarbons, phthalates and plasticizers, polychlorinated biphenyls (PCBs) and solvents. Organic compounds found in biosolids are present in such low concentrations (near the lowest detectable limits), that studies have found risks to be negligible. For this reason, the EPA did not include trace organics in the 503 Rule.

Odor

Odor issues are a common concern associated with biosolids applications. The odor varies depending upon the treatment process used and ranges from a strong ammonia scent to an earthy, organic smell similar to that of freshly sterilized potting soil. Odor perception varies from person to person.

Northwest Biosolids Management Association
821 2nd Ave. MS 81; Seattle, WA 98104-1598
phone: (206) 684-1145 fax: (206) 689-3485 world wide web: http://www.nwbiosolids.org

BIOSOLIDS RECYCLING fact sheet

NORTHWEST
BIOSOLIDS
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ASSOCIATION

AGRICULTURE

Biosolids recycled on agricultural lands provide plants with essential nutrients that speed growth and increase crop yield.

Seeking Solutions

Maintaining crop production and sustaining the environment are constant challenges to modern agriculture. Crop and livestock production remove nutrients from the land and can degrade the soil's structure and moisture holding capacity. This creates the potential for nutrient deficiencies, erosion and negative impacts to water quality.

Benefits of Biosolids

One way to improve soil quality and combat further deterioration is to replenish the soil nutrients that are needed for plant growth and add organic matter to improve soil structure and moisture retention. Biosolids recycling is a safe and environmentally sound way to return both nutrients and organic matter to agricultural soils, providing fertilization to crops and assisting in soil conservation.

How It Works

Biosolids contain essential plant macronutrients (used by plants in large amounts) including nitrogen, phosphorus and sulfur, as well as plant micronutrients (required in smaller amounts) such as zinc and copper. Applications of biosolids allow these nutrients to enter the soil for plant use. Biosolids are retained in the soil and release nutrients slowly as they are needed by plants. Appropriate applications of biosolids prevent nutrients from leaching beyond the plant rooting zone into the groundwater.

Biosolids applications promote plant root growth and generally help plants to grow greener, more vigorously and often with improved yields. The dense crops grown by biosolids create large amounts of straw and other organic matter that can be tilled back into the soil, improving soil moisture retention, tilth and erosion resistance, as well as increasing natural earthworm populations. Recent studies have shown that organic matter used in agriculture helps suppress plant disease. The addition of biosolids can also help to moderate highly alkaline or acidic soil conditions.

Biosolids have been recycled on pastureland, dryland wheat, barley, canola, hops, corn, raspberries and orchards in the Pacific Northwest. Application rates are carefully designed to meet the needs of individual crops. Dewatered biosolids are typically applied with calibrated manure spreaders and tilled into the soil, while liquid biosolids can be sprayed or injected below the soil surface.

Research and Demonstrations

Research plots and demonstration sites have shown that the quality of crops grown on biosolids-amended soils are equal or superior to those grown with commercial fertilizers. Biosolids applications also benefit soil through the additional crop organic matter grown and tilled back into the soil, which improves water infiltration and moisture retention.

What's Happening?

• *Dryland agriculture:* On biosolids-amended soils, farmers have seen good moisture retention (even during drought conditions), reduced wind erosion damage and improved crop color. Many dryland projects have shown considerable improvements in crop yield and vigor and soil properties. *Ellensburg, Everett, King County, Pullman, Spokane (Washington)*

• *Irrigated agriculture:* Biosolids are a desirable soil amendment in irrigated agriculture, reducing stress to plants between irrigation cycles. Following biosolids applications to highly alkaline soils, the return of a normal, healthy soil ecology is often indicated by renewed earthworm activity. *Greater Vancouver Regional District (British Columbia); Boise, Grangeville (Idaho); Albany, Gresham, McMinnville, Salem (Oregon); Bingen, Bridgeport, Chehalis, Clark County, Enumclaw, Kennewick, King County, Tacoma, Washougal, Yakima (Washington)*

• *Rangeland and pastureland:* Biosolids improve the quality of grasslands and their ability to support grazing animals including cattle, sheep, bison and wildlife. *Greater Vancouver Regional District (British Columbia); Eugene, Hillsboro—Unified Sewerage Agency, Portland (Oregon); Birch Bay, Blaine, Lynden, Everson, Nooksak, Sumas—BBBLENS, Pierce County, Tacoma (Washington)*

Key Plant Nutrients Provided by a Typical Application of Biosolids*

		lbs/acre
N	Nitrogen (available first year)	112
P	Phosphorus	210
K	Potassium	14
Fe	Iron	182
Mg	Magnesium	33
S	Sulfur (as sulfate)	4.0
B	Boron	0.2
Cu	Copper	6.5
Mo	Molybdenum	0.1
Mn	Manganese	13
Zn	Zinc	7.4
Ca	Calcium	258

* Based on a single biosolids application at the rate of 20 wet tons per acre, or 4 dry tons per acre

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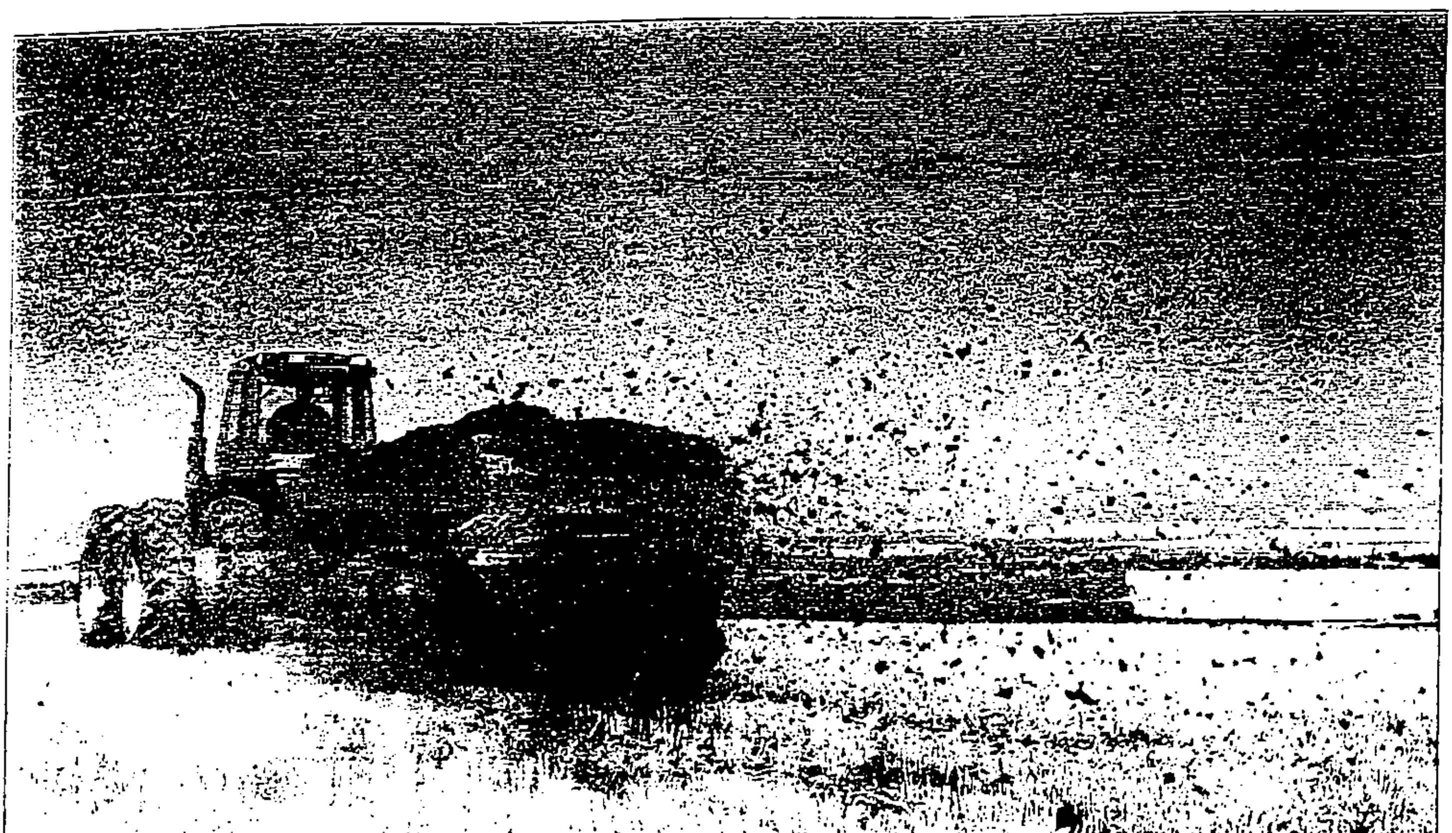
Weather/Page 3

THE WENATCHEE WORLD

Published in the apple capital of the world and the buckle of the power belt of the great Northwest

Don't hold your nose

Farmers smell money when processed human waste is spread on their fields



World photos/Mike Bonnicksen

A manure spreader distributes biosolids — processed human waste from King County — over a wheat field owned by Jim Ruud near Waterville. At top, a close-up look at the fertilizer on a field.

ATTACHMENT #7

Hold your nose: Farmers smell money

By MICHAEL McCLUSKEY
World staff writer

WATERVILLE — Put most people next to a pile of processed human waste, and they'll pinch their noses and turn away. Put a Douglas County wheat farmer by it, and he'll see black gold and smell money.

Farmers have quickly come to understand that the waste, called biosolids, can turn a good crop of wheat into a great crop.

Stand next to the jet-black piles, and you can see small pieces of plastic that survived the sewage processing system in King County. Stick your foot in the pile and it crackles and crunches as the crusty surface breaks. Take a deep breath and you'll notice a musty organic odor with a slightly ammonia smell.

RUUD

"To me, the smell means it's working," said Dave Ruud, 35, manager of Boulder Park Inc., which contracts with King County to bring the biosolids to the Big Bend wheat fields.

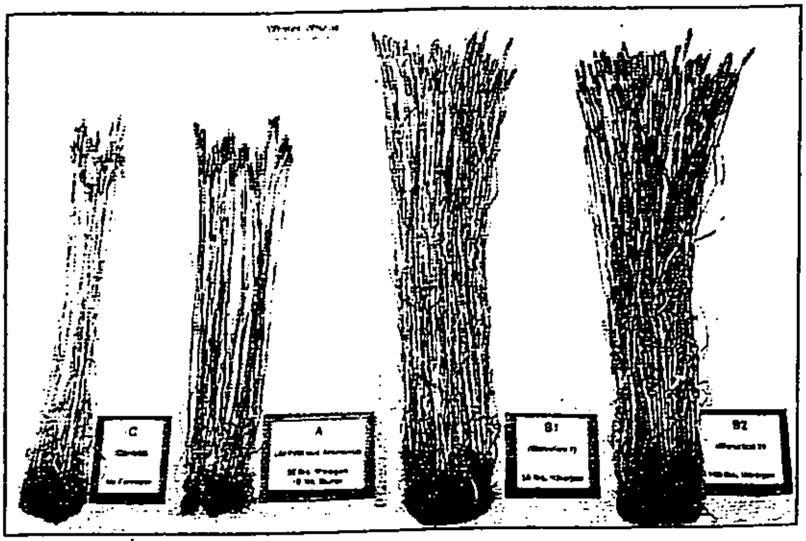
The biggest problem for Boulder Park Inc. is getting enough of the stuff. Demand far outstrips supply. More than 100 farmers owning 40,000 acres, mostly between Waterville and Mansfield, have received or are signed up to get the product. Many more would like it.

Biosolids are the organic residue from secondary treatment of sewage. The treatment removes the pathogens and most of the heavy metals. King County has applied biosolids to land since the early 1970s, first on forestry and composting operations. King County also sends biosolids to hop growers in the Yakima Valley.

The biosolids carry nitrogen, sulfur and phosphorus to the soil, replacing costly commercial fertilizers. Researchers have

"It's the best fertilizer I've ever seen."

—Leroy Thomsen, Boulder Park owner and farmer



This King County photo shows how well biosolids work. The two shocks of wheat on the right were treated with biosolids fertilizer. The one on the far left had no fertilizer, while the one next to it was treated with a standard commercial fertilizer.

found that the biosolids increase organic matter in the soil, improve fertility and reduce erosion, especially from wind. Increased soil compaction has been the only problem. And the biosolids, in contrast to conventional fertilizers, improve the soil for several years after application.

"It's the complete package of the fertilizers," Ruud said.

The Boulder Park founders tell about longtime friends who are mad they're not getting the organic fertilizer and joke about people moving signs so it will "accidentally" be delivered to their property.

"It's the best fertilizer I've ever seen," said Leroy Thomsen, 53, who owns Boulder Park Inc. along with fellow wheat farmers Gary Poole and Larry Glessner. All live between Waterville and Mansfield.

Farmers pay $1 per wet ton for the biosolids and Boulder Park hands that fee directly to King County, Ruud said. King County pays the hauling cost and also pays Boulder Park to apply the biosolids to the soil, Ruud said. The cost to farmers works out to $15 to $20 per acre, comparable to the costs of commercial fertilizers, Ruud said.

Tales of incredible yields abound in country without irrigation or the rich soils of places like the Palouse. Ruud, a fifth-generation wheat farmer, said yields are 10- to 25-percent higher on land treated with the biosolids compared with commercial fertilizers, and the increased yields continue for years.

Tests show wheat roots grow bigger in size, giving the wheat a better chance to survive winter. Sometimes the canopy of wheat is so thick that weeds don't get a chance to grow, eliminating the need for weed killers, Ruud said.

Boulder Park started as a test project in 1992. In 1994, Poole, Thomsen and Glessner formed Boulder Park as an organized way to bring the biosolids to the farmers. Under the contract, the King County Department of Natural Resources supplies a minimum of 20,000 wet tons per year, enough to cover 1,000-1,500 acres. King County actually delivers more than that, last year enough to cover 1,536 acres. Boulder Park also receives a smaller amount of biosolids from the city of Mount Vernon.

Before biosolids are applied, fields are tested to determine the nitrogen needs of the soil. Large trucks then dump the product in a field, where it sits in piles until the farmer spreads it. The biosolids work best the quicker they're plowed into the ground, Ruud said.

However, the project could become a victim of its own success. Demand is greater than the supply.

"We're competing for every drop of this we can get," Thomsen said.

Don't put that on a brochure

Douglas County accepts thousands of tons of biosolids and sludge, but you can't call it a wasteland

By MICHAEL McCLUSKEY
World staff writer

WATERVILLE — It's enough to make any tourism promoter blanch.

Every year, thousands of tons of biosolids find their way into arid, rural Douglas County. Trucks haul tons of processed human waste from Seattle and Mount Vernon, which end up nurturing dryland wheat fields. Septic tank wastes from Chelan and Douglas counties are also spread on fields overlooking East Wenatchee and Wenatchee.

It's not just human wastes that are imported to Douglas County. Sludge from apple juice plants in Cashmere and Wenatchee winds up on fields, too.

Some farmers pay to have the waste hauled onto their property. At $1 per wet ton (it's about 80-percent liquid), biosolids add nutrients that help produce exceptional crops of wheat. The county's dry climate, types of soils and distance to water make it attractive to dispose of wastes, said Ron Draggoo, the county's solid waste program director. And it's accepted in the county.

"The farmers and political climate are such they'll accept it," Draggoo said. "Douglas County has never discouraged land application of biosolids if it's monitored."

The human and agricultural wastes have different names, depending on their source and how they're treated. Biosolids are the treated products of primary and secondary waste-water treatment plants. Sludge includes organic wastes, mainly leftovers from making fruit juice. Septage is the term for wastes pumped out of septic tanks.

"If all are applied correctly, there should be very little risk to the public," said Randy Phillips of the Chelan-Douglas Health Department.

Biosolids are designed to be spread over farmlands, he said. Septage has less treatment than the others and must be tilled into the land within six hours of application. Sludge, because of its organic nature, poses very little risk. Risks increase, however, if the biosolids are not properly treated, if the sludge includes other industrial wastes or if the septage is com-

The biggest business is in biosolids. Boulder Park Inc., based in Mansfield, has permits to apply biosolids to 40,000 acres throughout the dryland wheat-growing plateau. Most of the biosolids come from King County. The first half of this year, 21,408 wet tons of waste were delivered to farms in the county.

Both the city of Bridgeport and the Douglas County Sewer District also dispose of biosolids through land application. Since 1994, Bridgeport has pumped out its lagoons, put the residue into cloth bags and left the bags on pallets to dry for three to six months. About two truckloads a month of the dried sewage are spread on five nearby dryland wheat fields. The East Wenatchee-based sewer district delivers the residue left over from its treatment onto fields near Pangborn Memorial Airport.

Both Tree Top and Glico have been disposing of fruit-processing waste for several years by injecting it into the soil. Tree Top's waste is spread onto a wheat farm southwest of Waterville and Glico's into a grass field near Pangborn Memorial Airport. Tree Top estimated it would spread about 1 million gallons this year. Tree Top's waste is spread by injection into the soil. Glico's waste is spread onto the soil by a tanker and plowed under by the landowner.

Apple Valley Pumping and WW Pumping each have dump sites on opposite sides of Blue Grade Road, north of East Wenatchee. Both companies pump out septic tanks and spread the contents on fields. They are required to till the septage into the ground within six hours, but do not have to otherwise treat it.

Last year, Apple Valley spread nearly 1 million gallons. In 1995, WW Pumping spread 135,000 gallons.

If chemical toilet waste is mixed in with the septic tank waste, however, it must be pretreated before it can be applied to the land. Apple Valley and WW Pumping now only have permits to apply septic tank waste and would have to modify their permits to include chemical toilet waste.

"There's a world of difference between material that has sat in a septic tank for five to seven years and something that potentially could have only been in there for hours," Draggoo said.

Another bumper crop

Big Bend wheat farmers say this year's crop is one of the best ever

By RICK STEIGMEYER
World agriculture writer

WATERVILLE — Up on the high wheat-carpeted plains of the Big Bend, harvest just keeps going and going and going.

Not only are Big Bend farmers harvesting one of their best crops ever, they've set a record for how late it will be before the grain is cut and put in storage.

While other wheat growers around the state are reporting an average crop this year, following a bumper crop in 1996, that's not the case for wheat farmers in the Big Bend — the high dryland plateau that sits in the crook of the Columbia River as it bends toward Grand Coulee Dam. Farmers in this arid region didn't do nearly as well as their brethren to the east and south last year. This year, they're naking up for it.

Yields of 60 to 80 bushels of wheat per cre have been reported in areas where nly 30 to 40 bushels were expected. ome fields near Coulee City yielded nore than 100 bushels per acre.

"Our crops are very good," said John Anderson, manager of Central Washington Grain Growers Association, a growers cooperative based in Waterville and the state's largest grain storage and shipping company. The company handles grain — mostly white winter wheat — grown on about 300,000 acres in Douglas, Chelan, Okanogan, Grant and Lincoln counties.

"Last year wasn't a banner year for us, although it was for the state. This year we're up about 25 percent, well above average," he said.

Some of the best yields around Waterville were on land treated with biosolids that came from King County waste treatment plants.

"This was the year we've been waiting for," said Dave Ruud, manager of Boulder Creek, Inc. The company delivers the biosolid fertilizer to about 00 farmers and landowners in the area. Those who have used the product for the ast few years showed a 10- to 25-percent ncrease in production this year over adjacent land where commercial fertilizers were used, he said.

The biggest surprise is how much better the harvest has been compared to earlier estimates, said Anderson.

"It's been miraculous," he said.

Richard Zones of Waterville dumps a flood of Eltan winter wheat into a truck as he harvests a field northwest of Waterville. He says it's the biggest crop he's ever had.

World photo/ Don Seabrook

Growers were not optimistic about their crops last spring when their winter planted wheat was still buried under 3 feet of snow. Wheat plants will develop a disease called snow mold after being covered for long periods. Some fields lay buried for five months.

Anderson expected farmers to have a poor crop as a result, and some did. But most fields responded to excellent conditions this summer, including something Big Bend farmers rarely see. Rain.

Waterville has received a little more than 7 inches of precipitation so far this

The wheat fields of the Big Bend are turning out a bumper crop this year.

World photo/
Don Seabrook

Wheat: Bumper wheat crop

From Page 1

year, only slightly more than the 100-year average. But it's about an inch and a half more than in the same period the year before. The area gets an average precipitation of only about 10 inches a year.

The big difference, said Mark Bareither of the Waterville Natural Resources Conservation Service, is that snowmelt went into the soil because the ground didn't freeze over last winter.

The Waterville-Mansfield area also had several dousing rains this spring and summer, about 4 inches worth. That rain, combined with increased moisture from snowmelt, allowed adventurous farmers to try something new.

Wade Troutman, for example, planted 800 acres of Northern spring wheat, a venture that would have seemed foolhardy most years.

"The moisture was there, so we decided to plant," said Troutman, a fourth-generation wheat grower who farmed about 1,800 acres this year north of Mansfield. The spring wheat had yields more than double normal, while his winter wheat yields were only average.

"I'd like to say I was really brilliant; but there was a certain amount of luck involved. You never know if you're going to get the rain."

Abundant rain and cooler daytime temperatures helped the wheat develop full heads of grain that set local test weight records, but the heavy crop has also prolonged harvest. Thick wheat takes longer to mature. And when it rains, it takes longer for the fields to dry.

Farmers like to harvest in the heat of August. Routinely, they're done by the third week of the month. Then, it's time to plant next year's crop, before September rains set in.

"We don't like to cut in September because the days get shorter, and there's dew in the morning. What takes a day in August, takes two days in September," said Troutman.

Already behind schedule, farmers have had to stop their harvests in order to plant next year's crop. They plant only about half of the land they own or lease each year because it takes a little more than a year to grow a crop on the normally parched land. Planting must be done before fall rains come and crust the soil. If it rains before the young plants poke through, the land must be reseeded.

"Timing is everything," said Troutman. Dry weather forced him to stop harvest and take time to seed. Wet weather halted everything. Troutman finally finished harvest Wednesday, but others are still at it.

Anderson estimated only about 60 percent of the Douglas County wheat crop has been cut. In the Coulee City area, harvest is about 85-percent complete.

Anderson said wheat isn't selling very well right now even though prices are low. Growers are hopeful demand and prices will increase later in the year.

That's the way it usually works, said Troutman, but many growers were hurt last year because prices reached an all time high in September — about $5 a bushel — and then dropped drastically after that.

Portland prices are still about 50 cents a bushel lower than they were at this time a year ago, said Anderson, but that's mainly due to harvest time oversupply.

California State Water Resources Control Board

Office of Water Recycling

RECLAIMED WATER USE IN CALIFORNIA

~~February 1998~~

Types of Reuse	Volume of Reclaimed Water Use Within Region, acre-feet/year											
	1	2	3	4	5F	5R	5S	6	7	8	9	Total
Agricultural irrigation	1,944	12,886	6,056	3,345	79,727	589	29,533	9,633	5,168	19,129	2,611	170,620
Landscape irrigation and impoundments	445	3,363	2,786	22,147	51	110	900	905	5,654	12,957	7,462	56,781
Industrial use	0	2,116	0	14,847	0	92	218	8	0	411	0	17,691
Ground water recharge	0	0	0	35,926	0	0	0	0	0	18	0	35,944
Seawater Barrier	0	0	0	6,971	0	0	0	0	0	2,638	0	9,608
Recreational impoundment	0	0	0	15,904	0	0	0	5,211	0	0	1,120	22,235
Wildlife habitat or misc. enhancement	1,669	2,013	0	7,616	0	0	1,008	8,836	0	1,604	0	22,746
Other or mixed types	11,416	54	102	1,949	0	0	727	0	0	3,481	34	17,763
TOTAL	15,475	20,432	8,944	108,704	79,778	792	32,386	24,593	10,822	40,237	11,227	353,390

Source: Office of Water Recycling, California State Water Resources Control Board

DRAFT 20-Jan-99

ATTACHMENT #8

TABLE 1
(OAR 340-55-015)

TREATMENT AND MONITORING REQUIREMENTS FOR USE OF RECLAIMED WATER*

NOTE: This table specifies the allowable beneficial purposes for various levels of quality of reclaimed water. If reclaimed water is to be applied to a specific beneficial purpose, all requirements — except advisory notices, but including footnotes, listed for that level of reclaimed water and use must be met.

CATEGORY	Level I	Level II	Level III	Level IV
Biological Treatment	X	X	X	X
Disinfection		X	X	X
Clarification				X
Coagulation				X
Filtration				X
Total Coliform (organisms/100 ml):				
Two Consecutive Samples	N/L	240	N/L	N/L
7-Day Median	N/L	23	2.2	2.2
Maximum	N/L	N/L	23	23
Sampling Frequency	N/R	1 per week	3 per week	1 per day
Turbidity (NTU):				
24-Hour Mean	N/L	N/L	N/L	2
5% of Time During a 24-Hour Period	N/L	N/L	N/L	5
Sampling Frequency				Hourly
GENERAL				
Public Access	Prevented (fences gates, locks)	Controlled (signs, rural or nonpublic lands)	Controlled (signs, rural or nonpublic lands)	No direct public contact irrigation cycle

(Numbers in the Table Refer to Footnotes)

CATEGORY	Level I	Level II	Level III	Level IV
Buffers for Irrigation:	Surface: 10 ft. Spray: site specific	Surface: 10 ft. Spray: 70 ft.	10 ft.	None required
Agricultural:				
Food Crops	N/A	N/A	N/A	Unrestricted
Processed Food Crops	N/A	1	1	Unrestricted
Orchards and Vineyards	N/A	2	2	Unrestricted
Fodder, Fiber, and Seed Crops not for Human Ingestion	3	1	1	Unrestricted
Pasture for Animals	N/A	4	4	Unrestricted
Sod	N/A	1	1	Unrestricted
Ornamental Nursery Stock	N/A	1	1	Unrestricted
Christmas Trees	N/A	1	1	Unrestricted
Firewood	N/A	1	1	Unrestricted
Commercial Timber	3	1	1	Unrestricted
Parks, Playgrounds, Schoolyards, Golf Courses with Contiguous Residences	N/A	N/A	N/A	5, 6
Golf Courses without Contiguous Residences	N/A	5, 7	5, 7	5, 6
Cemeteries, Highway Medians, Landscapes without Frequent Public Access	N/A	5, 7	5, 7	5, 6
Industrial or Commercial Use	N/A	9, 10, 11, 12	9, 10, 11, 12	9, 10, 12
Construction Use	N/A	9, 10, 11, 12, 13	9, 10, 11 12, 13	9, 10, 12, 13
Impoundments:				
Unrestricted	N/A	N/A	N/A	8, 10
Restricted	N/A	N/A	8, 10, 14	8, 10
Landscape Impoundments	N/A	8, 10, 14	8, 10, 14	8, 10

* DEFINITIONS:

Surface:	Surface irrigation where application of reclaimed water is by means other than spraying such that contact between the edible portion of any food crop and reclaimed water is prevented.
Spray:	Spray irrigation where application of reclaimed water to crops is by spraying it from orifices in piping.
Processed Food Crops:	Those which undergo thermoprocessing sufficient to kill spores of *Clostridium botulinum*. Washing, pickling, fermenting, milling or chemical treatments are not sufficient.
N/A:	This level of reclaimed water not allowed for this use.
N/L:	No limit
X:	Required treatment for this treatment level.
N/R:	Not required.

FOOTNOTES:

1 Advisory Notice Only: The Oregon State Health Division recommends that there should be no irrigation of this level of effluent for 3 days prior to harvesting.

2 Surface irrigation where edible portion of crop does not contact the ground, and fruit or nuts shall not be harvested off the ground.

3 The Department may permit spraying if it can be demonstrated that public health and the environment will be adequately protected from aerosols. Advisory Notice Only: The Oregon State Health Division recommends that there should be no irrigation of this level of effluent for 30 days prior to harvesting.

4 Surface or spray irrigation: No animals shall be on the pasture during irrigation.

5 Signs shall be posted around the perimeter of the facility's perimeter and other locations indicating that reclaimed water is used for irrigation and is not safe for drinking, and in the case of effluent quality Levels II and III for body contact (e.g., for Level IV, ATTENTION: RECLAIMED WATER USED FOR IRRIGATION — DO NOT DRINK · ATENCION: RECLAMADO DESPERDICIO DE AGUA USADO PARA LA IRRIGACION. NO BEBA EL AGUA; for Levels II and III, ATTENTION; RECLAIMED WATER USED FOR IRRIGATION — AVOID CONTACT — DO NOT DRINK · ATENCION: RECLAMADO DESPERDICIO DE AGUA USADO PARA LA IRRIGACION — EVITE EL CONTACTO — NO BEBA EL AGUA).

6 Reclaimed water shall be applied in a manner so that it is not sprayed onto areas where food is prepared or served or onto drinking fountains.

7 Reclaimed water shall be applied in a manner so that it is not sprayed within 100 feet from areas where food is prepared or served or where drinking fountains are located.

8 Signs shall be posted around the perimeter and other locations indicating that reclaimed water is used and is not safe for drinking, and in the case of effluent quality Levels II and III for body contact (e.g., for Level IV, ATTENTION: RECLAIMED WATER — DO NOT DRINK · ATENCION: RECLAMADO DESPERIDICIO DE AGUA — NO BEBA EL AGUA; for Levels II and III, ATTENTION: RECLAIMED WATER — AVOID CONTACT — DO NOT DRINK · ATENCION: RECLAMADO DESPERDICIO DE AGUA — EVITE EL CONTACTO — NO BEBA EL AGUA).

9 The Department may impose more stringent limits on the use of reclaimed water if it believes it is necessary to protect public health and the environment.

10 There shall be no disposal of reclaimed waters into surface or groundwaters without authorization by an NPDES or WPCF permit.

11 Use of reclaimed water in evaporative cooling systems shall be approved only if the user can demonstrate that aerosols will not present a hazard to public health.

12 Members of the public and employed personnel at the site of the use or reclaimed water shall be notified that the water is reclaimed water. Provisions for how this notification will be provided shall be specified in the reclaimed water use plan.

13 Unless decontaminated in a manner approved in writing by the Oregon Health Division, tanker trucks or trailers that transport and/or use reclaimed water shall not be used to transport potable water intended for use as domestic water. A tanker truck or trailer used to transport and/or use reclaimed water shall have the words "NONPOTABLE WATER" written in 6-inch high letters on each side and the rear of the truck. The words "NONPOTABLE WATER" shall not be removed until decontamination as approved by the Health Division has occurred.

14 Aerators or decorative fixtures which may generate aerosols shall not be used unless approved in writing by the Department. Approval will be considered if it can be demonstrated that aerosols will be confined to the area of the impoundment or a restricted area around the impoundment.

ADVISORY NOTICE ONLY:

The Oregon State Health Division recommends that persons who must handle irrigation or other equipment for reclaimed wastewater or who are exposed to reclaimed water should be fully advised of any hazards associated with such exposure and should be provided with necessary protective clothing.

MEMBER AND PATRON RESPONSES:
FEEDBACK QUESTIONNAIRE
[April 7, 1999]

The following table summarizes responses from two groups as of noon on April 7, 1999.

(1) Members of Friends of the Ashland Public Library returned postcards by mail; of the 303 mailed on March 29, 1999, 127 had been returned by our deadline.

(2) Patrons of the Ashland Library returned response sheets to a locked box placed next to the architects' model on March 30, 1999; 122 responses were received, of which 16 had comments only and four were unintelligible.

Support For....

	Original Design and $7.6 m Bond	Fundraising to Reduce Bond	Reduced Design and Reduced Cost
Members [N=127]	40%[a] (51)	47% (60)	31% (40)
Patrons [N=102]	47% (48)	21 % (21)	32%[b] (33)

[a] Multiple responses were permitted; therefore, percentage totals can exceed 100.
[b] The Response Card for the library drop box included the option "Only renovate the Carnegie." Nine respondents checked this response only and were included in this box.

REPRESENTATIVE COMMENTS FROM MEMBERS AND PATRONS, BY TOPIC
[Feedback sheet received by April 7, 1999]

Supportive of proposed design:

- I see the original design as totally reasonable and support the bond. Above all, do not just build a smaller version--we will regret it!
- Ashland will support this plan; it's a library-using town
- It's about time!
- Build it right for what we deserve.
- Top priority is renovate the our Carnegie; check parking access across street or in front of Carnegie

Supportive of reduced design:

- Need more details on how space reduction will affect services
- It's too grand; compromise.
- Build in phases over several years.
- We need a basic library without lounges and meeting rooms
- Like to see the cost of renovation or a smaller design before deciding
- Stay on current grounds but go higher, put parking underneath

Financial comments

- Need a strong campaign and confidence to pass bond issue
- $7.6 mil bond is not outrageous
- What is the life of the bond?

Other remarks:

- Many comments requesting more parking
- Many comments regarding the policy on dogs

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APPENDIX B: STANDARDS FOR OREGON PUBLIC LIBRARIES: 1994

Introduction

Since the 1940s, it has been a common practice of national and state library associations to adopt standards for public library service. Such standards have generally provided a means by which library managers, citizen library board members, and local officials can assess whether the resources that are being provided for local library service are sufficient. The American Library Association maintained a set of standards for public library services until 1966, when the decision was made to follow a new approach that emphasizes local needs assessment, planning, and evaluation. While more and more public libraries are adopting this new approach, there still appears to be a need for public library standards that represent a consensus of professional opinion on what is necessary to the provision of quality library service.

In response to this need, the leadership of the Oregon Library Association appointed a task force in 1987 to develop a set of standards for Oregon public libraries. This task force was charged with developing standards that would deal exclusively with resources necessary to "adequate" and "excellent" library services. The leadership of OLA further specified that the standards be stated in quantitative terms to the extent possible. The document, *Standards for Oregon Public Libraries: 1988*, was adopted by the OLA membership. OLA procedures were since amended authorizing the membership of a division to adopt standards or guidelines for library service or library practice that correspond to their specific interests and concerns. The Public Library Division of OLA began the process to revise the standards in 1993 with a survey of all public library directors. In 1994, a representative of the Public Library Division Executive Board and the State Library's library development administrator proposed revision after reviewing the survey results and comparing the original standards to actual statistics of Oregon public libraries and the most recent Consumer Price Index. The Public Library Division Executive Board approved the revisions on January 14, 1994. The Public Library Division approved the revisions on April 6, 1994. The OLA Executive Board accepted *Standards for Oregon Public Libraries: 1994* on June 3, 1994.

A. Library Governance

A public library should be legally established and maintained as a public agency in accordance with the provisions of ORS 357.410 to 357.430 and ORS 357.221 to 357.286. Public libraries established as departments of city or county government should have an advisory board comprised of five to fifteen citizens appointed and organized in accordance with ORS 357.465 to 357.490.

B. Hours of Service

The following standards do not include overlapping hours in different library facilities. All service schedules should include weekend and evening hours.

Population served by library	Adequate (hrs/week)	Excellent (hrs/week)
1 - 1,999	30	50
2,000 - 4,999	30	50
5,000 - 9,999	45	65
10,000 - 24,999	50	65
25,000 - 49,999	50	65
50,000 - 99,999	55	72
Over 100,000	55	72

C. Library Staff

The most important component of good library service is an educated and experienced library staff dedicated to providing the highest possible quality of library services to the public. Funding should be provided by the governing authority for staff to take advantage of continuing education opportunities and to participate in state, regional, and national library associations. The minimum starting salary for an entry-level professional librarian's position in Oregon should be $25,000.

Population served by library	Adequate*		Excellent*	
	Total	MLS	Total	MLS
1 - 1,999	1	0	2	1
2,000 - 4,999	1 / 2,000	0	1 / 1,000	1
5,000 - 9,999	1 / 2,000	1	1 / 1,000	2
10,000 -24,999	1 / 2,000	2	1 / 1,500	4
25,000 - 49,999	1 / 2,500	4	1 / 2,000	6
50,000 - 99,999	1 / 3,000	6	1 / 2,000	8
Over 100,000	1 / 3,000	1 / 12,000	1 / 2,000	1 / 6,000

**Numbers represent 40-hour equivalent paid staff positions.*

APPENDIX B: STANDARDS FOR OREGON PUBLIC LIBRARIES: 1994

D. Library Resources

Public libraries should have written collection development policies that include materials selection, procedures for reconsidering materials, evaluation, and weeding of the collection. All citizens should have direct access to a public library collection of current and useful materials in a variety of formats and indirect access, via interlibrary loan and by other means, to all of the library collections in their region and within the state. Standards for collection size are as follows:

Population	Adequate		Excellent	
served by library	Books	Audiovisual	Books	Audiovisual
1 - 1,999	10,000	200	20,000	400
2,000 - 4,999	15,000	300	25,000	600
5,000 - 9,999	3 pc	500	5 pc	1,000
10,000 - 24,999	2 pc	1,500	4 pc	3,000
25,000 - 49,999	2 pc	3,500	3 pc	7,000
50,000 - 99,999	2 pc	5,000	3 pc	10,000
Over 100,000	2 pc	.1pc	3 pc	.2 pc

**Numbers represent volumes or physical units of library materials.*
pc= per capita

Annual withdrawals of seldom used, outdated, or worn materials should comprise 2-5% of the collection. An annual acquisition budget should be provided which will maintain the quality of the collection.

In addition to the above, a public library should have subscriptions to periodicals as follows, with a minimum of 25 subscriptions:

Population served by library	Adequate
1 - 9,999	1.5 per 100 population
10,000 - 24,999	1 per 100 population
Over 25,000	.75 per 100 population

E. Library Facilities

Spacious, modern facilities are essential for good library services. Library facilities should be conveniently located and easily accessible to all segments of the population. The minimum space requirements shown below refer to the total square footage in all library facilities, including branches and mobile or portable facilities. Square footage requirements beyond the minimum standard will depend upon local library service goals, and, in particular, on the amount of programming that a library chooses to undertake.

Population served	Minimum space requirement
1 to 1,999	3,000 square feet
2,000 to 49,999	The greater of 3,000 square feet or .75 square feet per capita
Over 50,000	.6 square feet per capita

F. Library Operating Budget

All public libraries need adequate and stable funding from a variety of sources, public and private. Funding should be sufficient so that a wide range of library services can be provided without charge to local residents. Standards for total annual support of public library services, from all sources, are as follows (1993 dollars):

Population served by library	Adequate	Excellent
1 - 1,999	$37,000	$62,000
2,000 - 4,999	$18 per capita	$37 per capita
5,000 - 9,999	$16 per capita	$34 per capita
10,000 -24,999	$16 per capita	$31 per capita
25,000 - 49,999	$16 per capita	$27 per capita
50,000 - 99,999	$16 per capita	$27 per capita
Over 100,000	$16 per capita	$25 per capita

MINUTES FOR THE STUDY SESSION
ASHLAND CITY COUNCIL
April 8, 1999

CALL TO ORDER
Mayor Shaw called the meeting to order at 12:10 p.m. in the Civic Center Council Chambers.

IN ATTENDANCE
Councilors Laws, Reid, Hauck, Hanson, Wheeldon, and Fine were present. Staff present included: Assistant City Administrator Greg Scoles, Public Works Director Paula Brown, Director of Electrical Utilities Pete Lovrovich, Communication and Marketing Manager Ann Seltzer, and Director of Finance Jill Turner.

UPDATE ON THE WASTEWATER TREATMENT PLANT (WWTP) OFF-SITE PROJECT
Public Works Director Paula Brown noted that the packets that had been provided to the Council included detailed information in response to questions from the March 2nd meeting. Noted that the basic question had to do with the costs of different WWTP options if the off-site facility were not used.

Brown noted that Bob Eimstad of Carollo Engineers was present to provide information. Also noted that background information from 1995 was provided as an explanation of how the decision to use the off-site location was reached. Informed Council that Dennis Belsky from the Oregon Department of Environmental Quality (DEQ) was also present to answer questions.

Noted that neighbors had raised concerns about the treatment process to be used at the off-site location. Explained that she and Eimstad had prepared information on how the process was arrived at, and on the differences between Level II and Level IV treatment. Noted that these are standards set by the state.

Explained that the packets included a sheet from the Oregon Administrative Rules (OAR) dealing with the differences between treatment levels and the quality of water that results. Brown confirmed that tertiary treatment is a third stage of clarification, but that it does not result in Level III water. Tertiary treatment methods must be designed for the goals to be attained, and Ashland would need to specifically design a tertiary process for phosphorous removal.

Brown clarified that if tertiary treatment to remove phosphorous were designed, the quality of the water resulting would depend on the treatment design. Eimstad used the OAR sheet to explain the differences in treatment levels, noting that Level III requires more disinfection than Level II.

Reid questioned how smaller communities in Oregon, such as Myrtle Creek and Prineville, are able to use effluent to irrigate golf courses. Eimstad suggested that they were able to use Level II effluent. Hauck noted that it depends on whether there are contiguous residences. Brown emphasized that the off-site process was designed for agricultural use, without recreation. Pointed out that there are a number of situations where Level II water can be used, and emphasized that what is proposed is agricultural use on a controlled site that is not open to the public and is not a park. Level II is appropriate, cost efficient, and meets all applicable health standards.

Eimstad pointed out that this was intended in the design, as Level II can be produced more cheaply, and has a wide range of applications. Choosing to apply strictly on agricultural property, pasture grass with limited, controlled access, is a fairly conservative use. Emphasized that the level of treatment is a policy decision, and that there are cost implications along with this decision.

Brown responded to previous comments from a citizen that ultra-violet treatment would not work, stating that this is absolutely not the case. Emphasized that the ultra-violet process has been improved and the current plant is running this process with better-than-anticipated results for disinfection. This process has been approved by DEQ, it works well, and the DEQ encourages its use as it lowers toxicity levels without residual chlorine that would otherwise go into the Creek.

Brown noted that another issue raised had to do with pathogens in wastewater. Stated that both the DEQ and EPA require treatment of waters for re-use, and emphasized that *raw* sewage water is not to be used on the hillside, and that *sludge* is not to be put through the big gun sprinklers. All solids are treated, dried, and *only then* land-applied.

Brown let Council know that the DEQ had provided a letter of approval for the off-site facility with clarification that a value engineering process must be conducted. Brown noted that this process will occur within the next two weeks, and then the project will go to bid. DEQ also requested approval from the Division of Dam Safety/Water Resources, who has said they will sign off when the design is 100% complete. Eimstad added that progress drawings have been submitted and comments received. These comments have been addressed, and approval is viewed as a formality when the drawings are 100%.

Brown explained that the only piece of the off-site facility not approved yet by DEQ is the application process itself, and approval for that is not required until the City is ready to apply bio-solids to the hillside. Drying beds and lagoons are approved on the site, as is the effluent irrigation process. The application process will require approval, and public hearings will need to be conducted.

Brown discussed the "aerosol effect" issue raised at a previous meeting. Noted that she has looked at a considerable amount of research, and has found that finer mist sprayers can tend to have an aerosol effect which can be a concern when untreated effluent is used. However, the large sprayers proposed produce a heavier mist which drops quicker, and the City has 100-300 foot buffers, rather than the required 70 feet. Brown concluded that the aerosol effect is negligible, based on her research, and stated that she has spoken with the Utility Director in San Luis Obispo, California, as requested.

Noted that the packet included a letter from Carollo Engineers which addresses alternatives and costs. Explained that the current option being pursued in highlighted - taking treated effluent to Level II for spray irrigation at the off-site facility and applying dried bio-solids to the site. All cost comparisons are available, and the total project cost for each is listed so as not to mislead. Capital cost for the off-site portion is $8.6 million. If the bio-solids process were moved to the WWTP with an anaerobic digester, that would increase the cost by $8 million. The necessary sewer rate increase of 50-55% is shown. If processed on existing WWTP site, all of the existing site planned for future growth (beyond twenty years) would need to be used now. In addition, new trucks would be needed and bio-solids would need to be trucked away for agricultural application.

Another option, treating to Level IV and taking to off-site location, would cost an additional $5 million and mean a 30-35% rate increase.

Option four would treat effluent to Level IV and change the bio-solids process for treatment at the existing WWTP site for a total cost of $13 million, or nearly double the existing sewer rates.

Option five evaluates tertiary treatment programmed to remove all phosphorous, similar to an existing plant on the Tualatin River. This would increase costs by $1.8 million, and would have a rate impact of 10-15%. This would eliminate the need to pump and irrigate the off-site facility. However, this could limit future re-use opportunities for Creek water for irrigation. Noted that water rights for the off-site property would need to be used there to maintain the right. However, Brown stated that she has verbal approval to lease the agricultural right to in-stream if effluent is used for irrigation on the site. This would mean that the right wouldn't be lost, but it would take considerably more paperwork to change it to a municipal right in the future. Explained that once building begins on the property, she can make a written request for a leased change in use. Brown noted that the water rights on the property has not ever been proved up, but it would likely be about 600 acre feet which is not enough to address the 2 million gallon per day demand. Eimstad stated that it appears that water put back into the creek would be available for re-use, however it is not black and white at this point, and the issue is being contested in courts.

Council discussion on the clarification of use of water rights on the off-site property. Brown explained the water right for irrigation of the 200-acre Imperatrice property, and the possibility of transferring these irrigation rights elsewhere in the City.

Eimstad explained state law on the re-use of water in relation to potable water, noting that reclaimed water cannot be re-used for drinking, regardless of the treatment level.

Reid stated that alternative five seemed to have long-term benefits. Brown pointed out that there was still re-use of bio-solids at the off-site facility.

Brown explained option six as changing both the effluent treatment process to discharge into the Creek year-round, and treating the bio-solids at the WWTP site for an additional $8 million.

Eimstad further clarified the alternatives, noting that discharge into the Creek were actually cheaper because off-site irrigation requires numerous operation and maintenance costs.

Brown emphasized that both options six and seven would completely remove operations from the property. Explained that option seven was included at Councilor Fine's request, and that the prices were based on the 1995 facilities plan and could be higher now.

Hauck questioned the differences in the costs given here and those used in making the decision to go off-site four years ago. Asked whether the .08 phosphorous standard was more attainable today than it was at that time.

Eimstad noted that Unified Sewage Agency, which has the most sophisticated treatment plant in the state, would have difficulty meeting the .08 as a maximum number, but that it would be attainable as a median or average. Stated that a lot would depend on how the permits were written, but that regardless, the .08 is one of the lowest phosphorous limits in the Country and would require state-of-the-art treatment. Noted that discharge into Creek is not even allowed now, but that discussions with DEQ have indicated that if the phosphorous levels were met it might be possible.

Laws identified issues as, first, replacement water, because the City takes 1000-1200 acre feet while only returning 600 acre feet. Emphasized that the need to upgrade the WWTP has to do with the danger posed to fish in Bear Creek. Feels that option five has merit in that it would allow direct discharge into the Creek for a somewhat higher cost. The second issue is a matter of what information is trustworthy, based on the fact that some scientists have expressed concern about the safety of effluent and bio-solid application, while more mainstream scientists accept the standards used.

Reid commented that the phosphorous levels in the Creek are above .08 because of the natural area, and the City is being asked to remove naturally occurring phosphorous. Suggested that this may be due to the fact that there is not enough water in the creek because of agricultural use.

Eimstad confirmed that O&M costs are reflected in the "O&M plus Capital" column.

Brown explained that Class A bio-solid treatment was not considered because of the intended use.

Eimstad explained that diluting effluent with equal parts of irrigation water prior to discharge would not be allowed under the federal Clean Water Act or state law.

Discussion of whether returning irrigation water to the Creek flows would effect the TMDL calculations enough to effect the phosphorous restrictions. Eimstad did not feel that returning water to the Creek could be guaranteed when flows were at their lowest during drought conditions.

Brown confirmed that Bear Creek Valley Sanitation Authority (BCVSA) treats sludge at Level B, dries it, and applies it to agricultural land in the Sam's Valley area. Stated that Ashland currently applies Level B sludge in liquid form to agricultural sites as well.

Brown explained that the DEQ is watching to see that the City is fully compliant with the DEQ permit by December of 2000.

Brown explained the geology of the off-site location for Hanson, as explained in the geologic report by Foundation Engineering.

Turner stated that a 50-55% increase in the sewer rate would translate to about $14 per month for the average Ashland household.

Eimstad noted that construction is moving ahead of schedule. If a decision is not made promptly, or construction of off-site facilities begun, then there is a danger that there will be no place to discharge. Interim measures could be taken, but Carollo would prefer Council direction as soon as possible. Shaw explained that the project is still on task, and that nothing has changed unless Council directs otherwise. Emphasized that this study session serves to let Council look at additional information that has come forth based on neighboring property owner questions.

Council further discussed the level of water in the Creek at different times of year and the level of demand for fish. Reid questioned the requirements to cease Creek discharge arbitrarily, based on worst case scenarios rather than actual flows. Eimstad explained that there has been extensive discussion of this issue with the DEQ. Stated that there is some latitude in the permit to discharge based on actual Creek flows in November. Eimstad explained that it may be cost effective to continue to explore options in the future, but emphasized that to continue to look at changing the DEQ requirements now will not be able to have an effect before the deadline is reached. Emphasized that the treatment plant will have the flexibility to address permit requirements.

Dennis Belsky, of the Oregon DEQ, explained that Bear Creek was one of the first TMDLs formed statewide, and the .08 phosphorous limit is a maximum figure established around 1990. Explained that in the stream, the amount of algae growth is based on the mass of phosphorous entering. The .08 limit is the basis for determining viable treatment options.

Belsky noted further that constraints for discharge into Bear Creek are based on requirements in the Oregon Administrative Rules (OAR). Emphasized that the DEQ is equally as constrained as the City is by the OAR. Explained that phosphorous levels leaving Emigrant Lake are .08, so dilution the water has no effect. Emphasized is not a factor; the City must treat the water back to the background levels already present in the Creek.

Belsky stated that in a wet year such as this, the DEQ would need to look at balancing the risk of run-off from applied effluent versus direct discharge. Brown emphasized that this is why there needs to be a sixty day holding reservoir. Eimstad noted that there has been planning for contingencies, but in exceptional conditions there may be a need to ask the DEQ for exceptions.

Reid stated that she hopes the WWTP upgrade will have the flexibility to meet future political rulings and future lessons from science.

Eimstad explained that if alternative five was chosen, an extension would need to be requested, as design and construction would most likely be unable to meet the current deadline.

Shaw stated that the City would be willing to test the well water for the neighbors twice each year to address their concerns with possible well contamination. Brown stated that she would send a letter explaining to the neighbors that they could request tests biannually.

LIBRARY DISCUSSION

Assistant City Administrator Greg Scoles explained what has been done in the interim, noting that they have looked at programming space requirements and population projections.

Shaw emphasized that the square footage proposed came from the County, based upon population projections, and the outside consultant had agreed. Also noted that the two story design, and the fact that it is a Carnegie Library, carry inefficiencies which require additional square footage.

Scoles noted that there will be further information available by the end of the month. Stated that the population projections are based on a "service area" which is 32,000.

Council discussed the amount of square footage necessary. Clarified that Carnegie building is on the state's register for historic buildings. Questioned in anyone has spoken to the Historic Preservation Office.

CITY OF ASHLAND

Department of Public Works

Administration / Director's Office

MEMORANDUM

DATE: May 5, 1999

TO: Honorable Mayor and Members of the City Council

FROM: Paula C. Brown, Public Works Director / City Engineer Paula

RE: **WWTP - LOOSE ENDS**

I. Facilities Plan Figures

Attached are copies of three pages from the 1995 Facilities Plan. To adequately compare apples-to-apples costs, the comparison took into effect the capital costs only, and did not include the estimates for design as these were figured separately by Carollo. You will notice that the capital cost of advanced treatment year around discharge to the creek is $29.9 million. This was the only way to fully compare the options as we are proposing today.

However, when the costs are compared to the 'Total Present Worth" costs, that option was shown as $52.3 million as compared to the summer irrigation option of $36.9 million.

II Irrigation Rates, Application Volumes, Application Restrictions

The spray irrigation heads are rated at 294 gallons per minute. The treatment plant produces 1.87 million gallons per day that must be used through the irrigation heads. Staff has estimated each sprinkler head to be on for 5 minutes at any one time and that 5 sprinklers would be operating at the same time. There are a total of 135 heads on the property.

294 gallons / minute / head x 5 minutes x 135 heads = 198,450 gallons
used every 5 minutes assuming all heads were on

If the sprinklers are rotated so that all 135 sprinklers have 5 minutes at a time, 10 times a day, we would use 1,984,500 gallons of water. This means that each of the sprinkler heads would be on for less than an hour (50 minutes) total (in 5 minute increments) each day.

If only 5 of the total 135 sprinkler heads are on at any one time, there are 17 rotations. 17 rotations at 5 minutes per rotation means that the total sprinkler time would be 85 minutes to complete one full cycle. Ten cycles would be 850 minutes of total sprinkler time. There are 1440 minutes in a day - thereby leaving 590 minutes (or nearly 10 hours) each day for wind or other constraints. Please know that the 5 minutes per sprinkler is a worst case scenario. There may be times in which the sprinklers could be on for a longer period. We are constrained by the fact that we cannot have run-off, and that the plant/crop type must use the water sprinkled. There are sensors in the ground to ensure that there is no run-off and that there is no deep penetration of the water.

We will not spray when the wind velocities would take the water off of the site. The weather station on the site will monitor the wind velocity and wind direction to ensure that we will not over-spray. Buffers around the irrigation area (100-1000 feet - minimal requirement by DEQ is 70 feet for level II reclaimed water) are there to protect for over-spray as well.

III. Water Rights on Ashland Creek

Attached are two documents pertaining to the City's water right on Ashland Creek.

IV Cost Clarifications

I'm not sure where the Sneak Preview got the latest costs estimates, but to reiterate, the following explains the costs to date:

Current Capital Estimates:	
Construction of On-Site Process Improvements (Slayden)	$ 12,400,000
On-Site Changes (est) (Slayden)	620,000
Ashland Creek Pump Station (not bid)	1,000,000
Spray Irrigation and Biosolids Off-Site (not bid)	9,000,000
Design (Carollo - both sites)	2,200,000
Const Management and Inspection (Carollo - both sites)	1,800,000
TOTAL	**$ 27,020,000**
Wetlands (demonstration project)	480,000
Land Purchase (Reuse site)	900,000
WWTP Upgrade TOTAL	**$ 28,400,000**
O&M (20 years) plus Capital	**$ 31,596,000**

Table 9-6. Cost Comparison

Cost item, $1,000	Alternative: Wastewater Treatment in Medford	Summer Irrigation of City Property	Advanced Wastewater Treatment
Capital cost	21,782	27,086	37,403
Annual cost	783	904	1,231
Present worth of annual cost[a]	10,641	12,286	16,729
Salvage value	(3,944)	(5,436)	(4,069)
Present worth of Salvage Value[a,b]	(1,800)	(2,481)	(1,857)
Total present worth[a]	30,623	36,891	52,275

[a] Based on discount rate of 4 percent and a 20-year study period.
[b] Salvage value based on straight line depreciation over study period.

Present Worth Summary

From the present worth values in Table 9-6, Wastewater Treatment in Medford is the least expensive choice at $30,623,000. For Summer Irrigation of City Property, the present worth cost is $36,891,000, approximately 20 percent higher. Advanced Wastewater Treatment is the most expensive alternative at $52,275,000.

Key Cost Features

Wastewater Treatment in Medford consists primarily of a long interceptor sewer from Ashland to the existing BCVSA sewage collection system; no WWTP improvements are needed. This alternative takes advantage of the existing infrastructure of the Medford RWRF and avoids the costs associated with the operation and maintenance of the Ashland plant.

Summer Irrigation of City Property consists of upgrading the existing WWTP and purchasing land and irrigation equipment. This alternative takes advantage of the less stringent wintertime requirements for discharge to Bear Creek—nutrient removal processes are not included. Tertiary filtration would be used to reduce effluent solids and BOD to the required levels.

The high cost of Advanced Wastewater Treatment is not surprising because it represents the most complex treatment system. A brief inspection of the site layout (Figure 9-5) shows the relative complexity of this alternative.

Precision of Cost Estimate

As discussed in Chapter 7, the estimates in this report are order-of-magnitude estimates: in general, the more complex the alternative, the less precise the cost estimate—especially at the

Table 9-5. Estimated Capital and Annual Costs for Advanced Wastewater Treatment

Item	Cost[a]
Grit removal	15
Bar screens, headworks	435
Primary clarifier, existing	131
Primary clarifier, new	327
Alum mixing and feed	196
Aeration tanks, existing	244
Aeration tanks, new	1,675
Recycle pumping	100
Blowers (including building)	820
Secondary clarifier no. 1	317
Secondary clarifier no. 2	909
Tertiary clarifiers	3599
Tertiary filter	704
Disinfection	349
Chlorine scrubbing	183
Chlorine Contact	37
Anaerobic digester 2	887
Digester control building	910
Demolish secondary digester	139
Gravity thickeners	625
Sludge thickener	1,103
Facultative sludge lagoon[b]	1,148
Sludge transport	320
Operations building	473
Subtotal	15,646
Electrical/instrumentation[c]	3,129
Yard piping[c]	3,129
Contractor indirects/mobilization[d]	2,034
Subtotal	23,938
Contingency at 25%	5,985
Subtotal	29,923
Engineering, administration at 25%	7,481
Soil filter pilot study	0
Total capital cost	37,403
Annual operating cost	1,231

COMPARISON VALUE USED FOR CAPITAL COSTS

[a] Costs based on an *Engineering News-Record* construction cost index of 6100, expected to occur at midpoint of construction, November 1998.

[b] Includes sludge force main and pumping station.

[c] Estimated at 20 percent of subtotal.

[d] Estimated at 13 percent of subtotal.

SPRAY IRRIGATE IN SUMMER OPTION

Table 10-4. Cost Estimate Summary

Item	Phase 1 Cost, $1,000	Phase 2 Cost, $1,000	Phase 3 Cost, $1000	Total Cost, $1,000
Headworks, including odor control	435	-	-	435
Grit removal	-	15	-	15
Primary clarifier	131	-	-	131
Aeration basins, existing	244	-	-	244
Aeration basins, new	419	1,257	-	1,675
Blowers (including building)	656	164	-	820
Secondary clarifier No. 1	186	-	-	186
Secondary clarifier No. 2	12	-	-	12
Secondary clarifier No. 3	-	-	702	702
Disinfection	193	-	-	193
Chlorine scrubbing	129	-	-	129
Chemical feed/flocculation	-	-	200	200
Tertiary filter	-	469	235	704
Outfall	100	-	-	100
Irrigation pumping stations	-	274	-	274
Effluent storage/irrigation system[4]	-	1,598	500	2,098
Anaerobic digester No. 2	-	609	-	609
Digester control building	-	447	-	447
Demolish secondary digester	-	139	-	139
Sludge thickener	-	-	540	540
Facultative sludge lagoon[2]	-	-	801	801
Sludge transport	-	216	-	216
Subtotal	2,505	5,189	2,997	10,672
Electrical/instrumentation[6]	501	1,038	595	2,134
Yard piping[6]	501	1,038	595	2,134
Contractor indirect costs[7]	326	675	387	1,387
Subtotal	3,832	7,940	4,555	16,328
Wetlands[3]	338	-	-	338
Subtotal	4,170	7,940	4,555	16,666
Contingency at 25%	1,043	1,985	1,139	4,166
Subtotal	5,213	9,925	5,694	20,832
Engineering/administration at 25%	1,303	2,481	1,424	5,208
Subtotal	6,516	12,406	7,118	26,040
Land[5]	1,046	-	-	1,046
Total capital cost	7,562	12,406	7,118	27,086

Notes:

1 Costs based on an Engineering News-Record construction cost index of 6100, expected to occur at midpoint of construction, 11/98.
2 Includes sludge force main and pumping station.
3 Cost taken from Woodward-Clyde Facilities Plan Addendum.
4 Pond would provide 30 days' worth of effluent storage.
5 Assumes purchase of 700 acres for irrigation.
6 Estimated at 20% of subtotal.
7 Estimated at 13% of subtotal.

CITY OF ASHLAND

GARY MILLIMAN, CITY MANAGER PRO TEM

MEMORANDUM

TO: Mayor and City Council

DATE: September 24, 2021

SUBJECT: Treatment Plant Contract Operations

As the City Council considers connecting its sanitary sewer system to the RVSS and decommissioning its wastewater treatment plant as a cost-savings effort, I would like to present another alternative.

Due to rising operations/personnel costs and difficulties in recruiting/retaining certified operators, the City of Brookings began to explore contracting the operation of its water and wastewater treatment plants to a private operator in 2017. The City had taken steps to reduce residual solid waste disposal costs by some $500,000 annually, and had combined its water and wastewater treatment staffs, with all operators being cross-certified. But rate pressures also resulted in significant deferred maintenance.

The City embarked on a 12-month process to vet the concept of contacting the operation of the plants…which included contracting the operation and maintenance of pump/lift stations and water storage reservoirs…with the City Council, community and employees (the City employees who worked at these facilities were members of a collective bargaining unit represented by Teamsters).

Concerns that were raised and vetted included:

- A contract operator would defer maintenance and simply "run the plant into the ground" before the contract term was up.
- All of the current, mostly long-term employees would lose their jobs.
- The City would lose control of its rates as the rate formula included in the contract might exceed the cost of living.
- Management of the plant would not be under the direct supervision of the City Manager.
- The contractor would identify equipment replacement needs prematurely in an effort to reduce maintenance costs.
- The City would be "on the hook" for fines for regulatory violations attributed to errors made by the contractor.
- The contract does not cover everything, such as the cost of replacing major plant components.

Two companies that were contract operating water and wastewater plants in the west were invited to make presentations at two City Council study sessions. After deliberation, the City issued an RFP for contract operations and received two proposals. The RFP addressed all of the above listed concerns and others.

There are a limited number of companies who perform this service in the northwest. The City received two proposals and selected CH2M (now Jacobs Engineering) as the contract operator, executing a five-year contract in March 2018. The transition was very smooth.

First year savings was 22 per cent. The City Council used part of the savings to delay scheduled rate increases, and part of the savings to fund needed system improvements. Savings was realized primarily from the ability of Jacobs to acquire supplies used in the treatment process at a lower cost because of its bulk purchasing agreements and implementing cost-saving approaches to aspects such as disposal of sludge, and many operational efficiencies. Jacobs also employs a large cadre of certified operators and supervisors that can be assigned to the plant temporarily to cover vacancies and has the internal engineering capacity to address issues as they arise. They have well developed preventative maintenance, training and employee safety programs.

Since my departure from Brookings in July 2018, City Manager Janell Howard reports that the City is very pleased with the service and the relationship with the company.

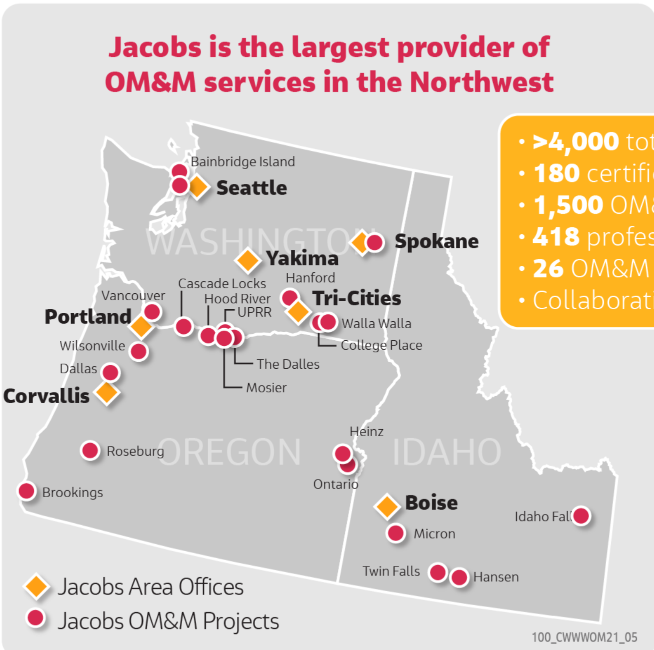
I have been in contact with Jacobs and they would be interested in making a no-obligation presentation at a City Council study session.

A Google search will find that not all cities that have retained Jacobs services have been satisfied with those services; I believe the City of Lebanon has recently decided to return to directly staffing its wastewater treatment plant following a dispute over the installation of a new treatment component that was recommended by Jacobs and is reportedly underperforming. Note that Jacobs is not the only contract private operator in Oregon; if the City elected to consider this option the operator would be selected through an RFP process.

Jacobs currently operates nine wastewater plants in Oregon.

Jacobs has provided full-service public-private contracts for O&M of municipal treatment facilities since 1980 – more than four decades. Today, our award-winning O&M team of over 4,500 employees serves hundreds of federal, municipal, and private-sector clients. We operate and maintain more than 300 facilities in the U.S., treating more than 1.2 billion gallons of water every day.

Jacobs serves more O&M clients and people in the Northwest than any other firm.



- **>4,000** total staff in the Northwest
- **180** certified operators
- **1,500** OM&M staff resources
- **418** professional engineers
- **26** OM&M clients
- Collaborative relationships with regulators

System assets are entirely owned by the cities we serve, and we provide full-time on-site staffing for day-to-day operations, as well as emergency coverage.

O&M staff are employees of Jacobs, and we are fully responsible for all aspects of facility management, operations, and maintenance.

SUMMARY OF CURRENT NW WATER/WASTEWATER O&M FACILITIES

Client	Wastewater Treatment Facility (mgd)	Drinking Water Treatment Facility (mgd)	Wastewater Lift Stations
City of Brookings, OR	15.6	2.6	13
City of Dallas, OR	3.4	N/A	N/A
City of Gresham, OR	20	N/A	N/A
City of Hood River, OR	3	N/A	5
City of Lebanon, OR	7	5	3
City of Ontario, OR	3.75	10	N/A
Roseburg Urban Sanitary Authority	8	N/A	7
City of The Dalles, OR	4.2	N/A	N/A
City of Wilsonville, OR	4	N/A	8
City of College Place, WA	1.5	N/A	3
City of Seattle Public Utilities, WA	N/A	180	N/A
Spokane County Utilities, WA	8	N/A	N/A
City of Vancouver, WA	16.1	N/A	N/A
City of Vancouver, WA	28.3	N/A	N/A
City of Walla Walla, WA	9.6	N/A	5