COVER SHEET

CH2M HILL ENGINEERS, INC.
REQUEST FOR QUALIFICATIONS BASED PROPOSALS
City of Ashland, OR

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<tr>
<th>Legal Name of Firm</th>
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<td>Mailing Address</td>
<td>2020 SW Fourth Ave. Ste 300, Portland, OR 97201-4973</td>
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<td>Contact Person</td>
<td>Jason Smesrud</td>
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<tr>
<td>Telephone</td>
<td>503.736.4372</td>
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<tr>
<td>Fax</td>
<td>503.736.2071</td>
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<tr>
<td>Email Address</td>
<td><a href="mailto:jason.smesrud@ch2m.com">jason.smesrud@ch2m.com</a></td>
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CH2M HILL Engineers, Inc. accepts all the terms and conditions contained in the City of Ashland Wastewater Treatment Plant Effluent Outfall Relocation Project (#2013-21), Request for Qualifications Based Proposal.

Signature of authorized representative: ____________________________ Date: February 25, 2014

Richard Attanasio, Designated Manager: 32-0100027

Name of authorized representative: Jason Smesrud, Project Manager

Firm’s Federal Tax ID: ____________________________

Names of person(s) authorized to negotiate contract:

Richard Attanasio, Designated Manager

Names of person(s) authorized to sign contract:

______________________________
1. Project Understanding & Approach

CH2M HILL will work with the City of Ashland to deliver a cost-effective integrated thermal solution to meet temperature compliance requirements for the wastewater treatment plant (WWTP). CH2M HILL and its team understand the public context associated with important public space and waterways around the WWTP and will develop an approach that will facilitate streamlined permitting and community support.

Project Understanding
The current National Pollution Discharge Elimination System (NPDES) permit for the Ashland WWTP expired in 2008 and the Oregon Department of Environmental Quality (DEQ) is planning to initiate the NPDES permit renewal process in fall 2014. The renewed NPDES permit will include requirements for effluent thermal load and copper limits at the point of discharge, considering mixing zone dilution. Compliance with the new limits will be required within five years of permit issuance.

The new requirements create several challenges for the Ashland Creek outfall, which has limited dilution during low flow periods. Relocating the outfall from Ashland Creek to the higher-flow Bear Creek would eliminate the current temperature impacts to Ashland Creek, while reducing the need for effluent cooling to address migration blockage, thermal shock, and spawning impairments. A Bear Creek outfall location would also provide greater dilution and a better mixing zone environment to meet restrictions on copper and other effluent constituents. However, even with an outfall relocation to Bear Creek, effluent cooling (by up to 1.5 to 2 degrees Celsius in September) would be required to avoid a migration blockage condition. In addition, during low flow portions of the spawning period (October 15 through May 15), effluent cooling may be necessary to meet spawning temperature restrictions at the new outfall site.

For Ashland’s outfall project, an implementable solution will need to achieve the following benefits: permit compliance on the stipulated schedule; low capital and O&M costs; minimal disturbance to adjacent open space resources; and support by the community and regulatory agencies. Our team’s understanding of key resources and community issues around the WWTP (Figure 1-1) will help Ashland achieve these project benefits.

CH2M HILL project teams have a long history delivering implementable solutions with excellent results in the Pacific Northwest. Our previous successes with outfall, effluent temperature, and constructed wetland projects across Oregon demonstrate our track record. We will exceed Ashland’s expectations for its outfall project using our team’s knowledge and experience gained from similar projects. Our team, including Keller Associates and The Freshwater Trust, will manage all phases of the project from planning through permitting, design, construction, and operation. Our site-specific knowledge of the Ashland WWTP, Ashland and Bear Creeks, and surrounding resources, as well as our relationships with local agencies and community leaders, will help us navigate towards a cost-effective solution that agencies readily approve and the community embraces.

Project Approach
This section includes key factors to help achieve project success through Phase 1 of the outfall project.

Integrated Thermal Solution: Our approach will include project alternatives that address both near- and far-field thermal load and temperature mitigation requirements. We will begin by developing solutions that meet the near-field temperature limitations (i.e. migration

FIGURE 1-1. Key Considerations
Natural resource and community constraints and opportunities around the WWTP will be clearly identified to develop project solutions and to navigate towards a streamlined permitting approach. Our involvement with other projects such as the Bear Creek BiOp will also be valuable in building an understanding of future flow regimes and dilution.
Our Preliminary Ashland Wastewater Treatment Plant Effluent Outfall Relocation Project supported the relocation benefits through an understanding of Ashland’s developing wetlands and floodplain impacts, and opportunities for developing artificial wetlands and ponds that are exempt from the requirements, will be addressed early in the project definition phase. This approach was applied successfully for the Albany, RUSA, and Woodburn projects described in Section 3.

Supported by the Community: Our team joined the community in preliminary discussions on outfall relocation options, where we gained a keen understanding of the community’s sentiments and values for certain open space assets. We recognize that Ashland’s success through this project depends on developing temperature and outfall solutions that enhance the aesthetics, recreational, and educational opportunities surrounding the WWTP, without restricting current public uses of Glendower Pond and other open space assets. We will work with the City to deliver a project that provides not only short term support but long term value. We will build this support through meetings with the Ashland Parks Commission, neighborhood associations, and an on-line web presence.

Preliminary Statement of Work

Our team has developed a preliminary statement of work that accomplishes the requested tasks through the completion of Phase 1. A Gantt chart with major work tasks, milestones, and durations through Phase 1, for completion by October 1, 2014, is presented in Figure 1-2 at the end of this section.

Task 1. Project Definition and Preliminary Analysis

Task 1.1. Project Initiation: Attend kick-off meeting with the City to confirm project goals and success factors, communication protocols, and key project stakeholders. Additionally, we will discuss priority issues that have been raised by permitting agencies, the parks commission, stakeholders, and the public.

Task 1.2. Preliminary Flow, Temperature, and Dilution Analysis: Flow and temperature data from Bear and Ashland Creeks and Ashland WWTP will be analyzed. Heat Source Wetlands (HSW) models of Glendower Pond (open water pond) and densely vegetated constructed wetlands will be developed using Ashland climatic data. Temperature results will be used to guide initial sizing of pond/wetland areas needed to meet temperature standards. The DEQ analysis of dilutions to avoid migration blockage and spawning impairment will be updated.

Task 1.3. Project Alternatives Definition: Using the information from Task 1.2, a range of options will be identified that can technically meet the water quality criteria for near field temperature impacts.

Task 2 Deliverable: Technical memorandum summarizing modeling and list of identified alternatives.

Task 2. Natural Resources and NPDES Permitting

Task 2.1. Preliminary Environmental and Permitting Analysis: Using the results of Task 1.3, a preliminary environmental permitting analysis will be conducted to identify potential environmental constraints and approvals/permits needed from local, state, and federal agencies (DEQ, Jackson County, USACE, USFWS, NMFS, DSL, SHPO) during Phase 2. Available information will be utilized; all required approvals, permits, and Phase 2 studies will be clearly summarized; and a permitting strategy will identify opportunities for impact avoidance and potential mitigation.

Task 2.2. Preliminary Wetland Delineation: Delineate regulatory wetlands and waters within the defined boundaries of the study area. The task will include the background research, field work, and preliminary wetland mapping to inform the preliminary design process. Completion of the wetland delineation report and submittal to agencies will occur in Phase 2.

Task 2.3. Agency Pre-Application Meeting: Following the completion of Task 1, 3.1 and a draft level completion of Task 2.1, 3.2, and 3.3, we will hold a pre-application meeting with key agency staff to solicit input on the planned project elements. Results of this meeting will inform the completion of Task 2.1 and the identification of conveyance routes and wetland locations to be incorporated in Task 3.

Task 2 Deliverables: Technical memorandum and meeting notes for incorporation into the predesign report.
Task 3. Preliminary Design

Task 3.1. Field Data Collection: Obtain data required to support the outfall mixing zone dilution study and preliminary design of the outfall pipeline, diffuser, and constructed wetlands. Field data collected during spring/summer 2014 will include: geomorphic investigation and detailed riverbed bathymetry/velocity profiles at the proposed new outfall locations.

Task 3.2. Outfall and Diffuser Preliminary Design: Develop two outfall relocation concepts and dilution modeling of the concepts for existing, selected planning horizon, and outfall flows. Perform hydraulic modeling evaluations to define future capacity needs so that outfall diffusers can be designed to accommodate full outfall. Meet with the City to review findings and recommendations to facilitate selection of a preferred alternative. Incorporate the preferred alternative into a mixing zone dilution report that meets the requirements of Oregon DEQ’s Mixing Zone Internal Management Directive.

Task 3.3. Wetland Preliminary Design: Develop preliminary design of constructed wetlands necessary to meet the near field temperature criteria. Prepare hydraulic profiles and identify major conveyance needs, routes, and sizing. Finalize HSW models developed under Task 1.3, with final wetland footprints and flow routing to simulate the effluent cooling. Compile the information into a revised analysis of migration blockage and spawning impairment conditions; quantify total excess thermal load benefits (annually, by month) to complement efforts by the City to address far field temperature impacts and thermal mitigation requirements.

Task 3.4. Preliminary Engineering Design Report: Document the results of Tasks 1 through 3, along with facility cost estimates, in accordance with the DEQ Guidelines for Writing Engineering and Pre-Design Reports, to facilitate written DEQ approval of the design report.


Task 4. Public Outreach and Communications

Task 4.1. Public Outreach and Communications Strategy: Develop a public outreach and communications strategy, in concert with the City, to create an effective communication process that is transparent and inclusive.

Task 4.2. Public Meetings: Prepare supporting graphic poster boards, handouts, and other materials to facilitate information exchange. Key CH2M HILL team members will present project proposals for discussion and will document public comments. Presentations are planned for at least one Ashland Parks Commission and one City Council meeting.

Task 4 Deliverables: Public communications strategy, communications media, and talented specialists to support public outreach efforts. Tours of other Oregon wetland/park sites can be arranged if desired.

Task 5. Project Management and Quality Control

Task 5.1. Ongoing Project Management: Develop the project execution plan, project instructions, and prepare monthly progress reports and billings.

Task 5.2. Quality Assurance/Quality Control: Develop and follow the Quality Management Plan (QMP).

Project Management and Quality Assurance

Our project management approach will include timely and effective communication with Scott Fleury, including review of key findings, permitting, design, meeting coordination, status of regulatory discussions, public outreach, and budget and schedule status (including date of deliverable submittals). Our project manager, Jason Smesrud, will meet regularly with Mr. Fleury to review the project status. The meetings will review work recently completed and forthcoming work, and will address outstanding or newly identified information requests. At the conclusion of each month, CH2M HILL will prepare a monthly written report to accompany invoices, including scope, schedule, and budget status. The monthly status reports will include a graphical representation of the project financials, so that Mr. Fleury and City staff can quickly ascertain status by project task.

Mark Madison will serve as the team’s quality manager, overseeing the implementation of CH2M HILL’s Water Business Group QMP. The key tenets of CH2M HILL’s quality program are: 1) Continuous quality control is built into the project by involving the appropriate technical staff from project inception; 2) While the project manager is ultimately responsible to ensure quality work products, the entire project team is responsible for the quality of work being performed; and 3) All deliverables must be reviewed by a qualified technical reviewer before being submitted to the City. The project will have a QMP that defines the work plan for quality assurance/quality control. The QMP will succinctly identify deliverables for review, qualified reviewers, and establish timelines and budget for reviews.
FIGURE 1-2. Phase 1 Work Schedule

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Planning and scoping of Phase 2 activities will be defined throughout the process of the Phase 1 project. The Preliminary Engineering Design Report will lay out a schedule and plan for completion of the Phase 2 project.
2. Project Team and Resources

The CH2M HILL project team offers the City proven resources with experience delivering similar outfall and temperature mitigation projects in Oregon from planning through permitting, design, construction, and operations. This team also has a deep understanding of the complex local community and regulatory issues critical to the success of the project.

Project Team

CH2M HILL, a world renowned wastewater planning and design firm, will lead our team with key project personnel based primarily in our Portland and Corvallis offices. We are proud to include Keller Associates and The Freshwater Trust, with their deep understanding of local stakeholders and regional regulatory issues, as subconsultants to augment our expertise. Our combined team is shown on Figure 2-1.

**FIGURE 2-1. Organization Chart**

Keller Associates specializes in wastewater treatment and design and has been successfully providing wastewater planning and design support services to the City of Ashland for the last three years, including Ashland’s Comprehensive Sanitary Sewer Master Plan and its Wastewater Facility Planning Study. The Freshwater Trust (TFT) is a nonprofit organization with 30 years of experience implementing high-quality restoration projects in the Pacific Northwest. The Trust has been active in the Rogue Basin since 1994, recently providing active riparian restoration on the Rogue River, Little Butte Creek, and Applegate Creek as part of the Medford Water Quality Trading Program. TFT is also currently undertaking analysis of in-stream flow augmentation opportunities in the Bear Creek region for the Bureau of Reclamation, which could provide valuable context when examining alternatives for the City. CH2M HILL and TFT are currently working together to provide a multi-faceted total temperature compliance solution for the City of Boise. We have developed a strong and enduring relationship from the Boise project and other efforts in Oregon and we look forward to partnering once more for Ashland’s success.

Our project team will be led by CH2M HILL’s Project Manager, Jason Smesrud, located in our Portland office. Jason has proven success designing and delivering highly complex thermal control wetland projects throughout Oregon, as demonstrated by his work at Woodburn, Albany, and Roseburg. He is particularly adept at coordinating permitting issues and communicating with regulators to deliver projects on schedule and under budget. Jason, highly respected as the region’s top expert in temperature mitigation wetland design, developed the HSW model (described further under the Project Resources section). CH2M HILL will also provide some of the region’s top experts in mixing zone analysis, outfall design, permitting and community outreach, all with extensive project experience in Oregon.

James Bledsoe, Keller Associates, will provide planning and design of pumping and off-site piping improvements. James was the project manager for Ashland’s Comprehensive Sanitary Sewer Master Plan and is currently overseeing the completion of Ashland’s Wastewater Facility Planning Study. He also helped with the State Revolving Fund loan process associated with related wastewater projects and brings a unique understanding of Ashland’s WWTP and planning efforts to address the City’s thermal load compliance.

Eugene Wier will serve as TFT’s project manager coordinating its contribution to the community outreach and permitting support efforts with CH2M HILL. Eugene brings a wealth of local knowledge, with more than a decade of professional experience conducting fish and wildlife research and habitat restoration in southern Oregon and northern California. Based in Ashland and working in the Rogue Basin for more than 16 years, Eugene has developed strong relationships with local landowners, watershed councils, nurseries, and community stakeholders from projects in the Rogue River region.

Key personnel are listed in Table 2-1 along with project roles, specialized expertise, related project experience, and percent time commitment during key periods of project execution.

Project Resources

One of the key project resources that is unique to the CH2M HILL team is the HSW model that was developed in-house by Jason Smesrud for design of temperature mitigation wetlands. This hourly time step dynamic energy balance model has been validated using measured flow/temperature data on a range of aquatic systems, from open ponds to densely shaded emergent vegetation wetlands, and has been applied to projects in OR, CA, WA, and ID. Model documentation and proofs of calibration are available upon request.
## 3. Related Project Experience

Our team’s experience managing temperature mitigation wetlands and outfall design projects in Oregon is extensive. We will rely on our experience and technical expertise to maximize value for the City and acceptance by stakeholders. Below we provide project descriptions for several directly relevant projects along with schedule and budget information and references (Table 3-1 provides a broader list of CH2M HILL’s outfall projects). We invite you to contact our references (provided as an attachment) for additional information and to discuss our performance.

### Albany-Millersburg Talking Water Gardens, Albany and Millersburg, Oregon and ATI Wah Chang

**Team Members:** Jason Smesrud, Mark Madison, Linda Macpherson, Peggy O’Neill, David Wilson

**Project Description:** This 37-acre functional wetlands system provides cooling and natural treatment of treated effluent from the Albany-Millersburg Water Reclamation Facility and local rare metals manufacturer ATI Wah Chang before discharge to the Willamette River. Our team developed the project concept, applied for all permits, secured ARRA funding, completed designs and construction management, and advised the operations team. The innovative project concept results in a treatment system that effectively addresses new regulatory challenges while creating ancillary social, environmental, and economic benefits, including trails and outdoor recreation amenities.

**Project Outcome:** Winner of awards from USEPA, American Academy of Environmental Engineers; Oregon Chapter of the American Public Works Association; and League of Oregon Cities. Talking Gardens Wetlands Park has become a valued community asset attracting positive attention from around the world.

**Budget and Schedule:** Final Design/SDC Plan Budget – $912K; Actual Budget – $912K

Scheduled Completion – April 2010; Actual Completion – April 2010

### Natural Treatment System, Roseburg Urban Sanitary Authority (RUSA), Oregon

**Team Members:** Jason Smesrud, Mark Madison, Linda Macpherson, Peggy O’Neill, David Wilson

CH2M HILL provided permitting, preliminary and final design, and services during construction and operation for the natural treatment system, which includes constructed wetlands, land application at agronomic and high-rate irrigation, subsurface hyporheic discharge, and restoration of historic natural wetlands located on 340 acres of RUSA-owned farmland adjacent to the wastewater treatment facility. Our team also provided key support in compliance negotiations and permit modifications with regulating agencies.

**Project Outcome:** Successfully reducing phosphorus loads and temperature in the South Umpqua River beyond permit requirements.

**Budget and Schedule:** Final Design/SDC Plan Budget – $920K; Actual Budget $920K

Scheduled Completion – May 2009; Actual Completion – May 2009
Woodburn Natural Treatment System Improvements, City of Woodburn, Oregon

Team Members: Jason Smersud, Lynne Chicoine, Mark Madison, Linda Macpherson, Peggy O’Neill, David Wilson, Vince Rybel

CH2M HILL worked closely with the City of Woodburn, beginning in the early 1990s, to establish a natural treatment system at the WWTP to cost-effectively improve and preserve Pudding River water quality. Our work included facilities planning, design, construction, and operations assistance for a full-scale 84-acre poplar plantation. In 2008, CH2M HILL helped the City plan for the next phase of WWTP upgrades to meet new temperature TMDLs. CH2M HILL led the facility plan update and completed preliminary through final contract document preparation for WWTP upgrades and natural treatment systems, including 25 acres of poplar trees, 26 acres of constructed wetlands, new pump stations and conveyance, a new outfall into the Pudding River, and a 10 MG irrigation reservoir.

Project Outcome: Project has received all required permits and approvals for construction. Construction is pending resolution of Oregon TMDL issues.

Budget and Schedule: Schedule A Final Design Plan Budget – $498K; Actual Budget $498K
Scheduled Completion – April 2012; Actual Completion - February 2012

Projects by Keller Associates and The Freshwater Trust

Keller Associates:
- Ashland, OR: Comprehensive Sanitary Sewer Master Plan; coordinated evaluation of disposal options, including shading plan; evaluated maintenance management software; evaluated SCADA system; staffing analysis support; oversaw assessment of pumping facilities.
- Stayton, OR: Served as Owner’s Representative for the Mill Creek Lift Station and Pipeline Design-Build Project.

The Freshwater Trust:
- Medford, OR: Contracted in 2012 to manage an ongoing $8 million temperature trading program for the City of Medford to comply with thermal load requirements of NPDES permit. To date, have completed 6 riparian restoration sites of a necessary 20-25 by 2022, and through revegetation work have developed close working relationships with restoration and permitting groups in the basin.
- Rogue River Basin, OR: Contracted by the U.S. Bureau of Reclamation in 2013 to determine potential riparian and other habitat restoration and flow augmentation activities to meet obligations under a recent biological opinion, with ongoing analysis primarily centered on Bear Creek. Active project implementation for Reclamation to begin as early as Fall 2014 and continue through 2020.
- Boise, ID: Working in partnership with the City of Boise and CH2M HILL to develop an integrated thermal load solution for effluent discharge from the West Boise and Landers Street WWTPs. Solutions include a combination of riparian restoration (TFT) and cooling wetlands/ponds (CH2M HILL) designed to meet thermal load requirements throughout the year.

4. Responsiveness

CH2M HILL’s team anticipates fielding questions and inquiries from the City that will require immediate attention at the project site or at City, agency, or stakeholder offices. We are very well positioned to respond (Figure 4-1). With CH2M HILL offices in Redding, Corvallis, Bend, and Portland, qualified staff can arrive on site in about two hours, and the majority of the team can arrive within about four hours. Furthermore, Keller Associates has a demonstrated track record supporting Ashland’s engineering needs from its Salem, Oregon office and corporate headquarters in Meridian, Idaho. Finally, TFT has two employees working in Ashland, led by public participation team member Eugene Wier, with supporting staff at its main office in Portland, OR.

As a matter of sound economics and productivity, our team relies on the use of on-line tools to facilitate meetings when face-to-face contact is not required. Our project manager will use CH2M HILL’s web-based Oracle project database to track costs in real time (updated on at least a weekly basis), and to project costs forward to develop estimates-to-completion and associated estimates-at-completion. The tools we use to manage communications, time, and costs are a big part of our commitment to our clients.
### Example Outfall Projects Across Oregon
Conducted by the Outfall Design Team

<table>
<thead>
<tr>
<th>Client</th>
<th>River</th>
<th>Client</th>
<th>Project</th>
<th>Staff</th>
<th>Mixing Zone Analysis / Study</th>
<th>Field Data Collections</th>
<th>Outfall and Diffuser Design</th>
<th>In-water Permitting</th>
<th>Water Quality Permitting</th>
<th>Community Outreach</th>
<th>Services During Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clackamas County WES</td>
<td>Willamette</td>
<td>Randy Rosane, Project Manager, WES, 503-742-4573</td>
<td>Tri-City WPCP Outfall Remediation Project (2011-2012)</td>
<td>Rybel, Wilson</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
</tr>
<tr>
<td>Clackamas County WES</td>
<td>Sandy</td>
<td>Randy Rosane, Project Manager, WES, 503-742-4573</td>
<td>Hoodland STF Discharge Alternatives Plan (2012-2013)</td>
<td>Smesrud, Wilson, O’Neill</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
</tr>
<tr>
<td>Clackamas County WES</td>
<td>Sandy</td>
<td>Randy Rosane, Project Manager, WES, 503-742-4573</td>
<td>Hoodland Mixing Zone Study (2008)</td>
<td>Wilson</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
</tr>
<tr>
<td>Clackamas County WES</td>
<td>Willamette</td>
<td>Michael Trent, Wastewater Supervisor, Tri-City Service District, 503-557-2804</td>
<td>Tri-City Velocity Measurements (2007) &amp; Dilution Modeling</td>
<td>Wilson</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
<td>★★</td>
</tr>
</tbody>
</table>
References

Albany-Millersburg Talking Water Gardens, Albany and Millersburg, Oregon and ATI Wah Chang
Tom Tenpas, Talking Water Gardens Manager, Albany, OR, tom.tenpas@cityofalbany.net, 541.497.6224

Natural Treatment System, Roseburg Urban Sanitary Authority (RUSA), Oregon
Ron Thames, General Manager, RUSA, Roseburg, rsthames@rusa-or.org, 541.672.1551

Woodburn Natural Treatment System Improvements, City of Woodburn, Oregon
Randy Scott, Division Manager, Water Resources, Woodburn, OR randy.scott@ci.woodburn.or.us, 503.980.2427
Curtis Stultz, Section Supervisor, Wastewater, Woodburn, OR, curtis.stultz@ci.woodburn.or.us, 503.982.5281

Projects by Keller Associates and The Freshwater Trust

Keller Associates:
Ashland, OR: Comprehensive Sanitary Sewer Master Plan
Mike Faught, Public Works Director, Ashland, faughtm@ashland.or.us, 541.552.2411.

Stayton, OR
Dave Kinney, Public Works Director, Stayton, dkinney@ci.stayton.or.us, 503.769.2919.

The Freshwater Trust:
Medford, OR.
Plant Superintendent, Medford, dennis.baker@cityofmedford.org, 541-774-2750

Rogue River Basin, OR
Dawn Wiedmeier, Deputy Area Manager, Bureau of Reclamation, dwiedmeier@usbr.gov, 509-575-5848
Resumes

CH2M HILL
Lynne Chicoine
Linda Macpherson
Mark Madison
Peggy O’Neill
Vince Rybel
Jason Smesrud
David Wilson

Keller Associates
James Bledsoe

The Freshwater Trust
David Primozich
Eugene Wier
Lynne Chicoine, PE
Principal in Charge

Relevant Experience
Ms. Chicoine is a civil engineer and project manager with CH2M HILL’s Water Business Group in Portland, Oregon. She has 30 years of experience on a wide range of water and wastewater engineering projects. In addition to managing three significant Oregon wetlands projects, her experience includes facilities planning, conceptual to detailed design, preparation of specifications and drawings and operation and maintenance (O&M), and engineering services during construction for aeration basins, digesters, thickeners, centrifuges and belt filter presses.

Representative Project Experience
Project Manager; Fernhill Wetlands Phase 1A; Clean Water Services; Washington County, OR. Ms. Chicoine managed the design and construction of 2 acres of surface wetlands, the first phase of a 400 acre natural treatment system which will include storage for water reuse, agricultural irrigation and subsurface wetlands. The project also included development of a site-wide conceptual plan.

Project Manager; Woodburn Mill Creek Pump Station, Publicly Owned Treatment Works and Natural Treatment System; Woodburn, OR. Managed design of $10 million improvements for the City of Woodburn that includes improvements to and expansion of a Trojan 4,000 UV system and 23 acres of treatment wetlands for effluent temperature control.

Task Lead; Wastewater Facilities Plan; City of Woodburn, OR. Prepared alternatives analysis and developed recommended plan for industrial and municipal wastewater treatment for liquids and solids facilities including separate and combined treatment of industrial flow. Treatment consists of conventional activated sludge and anaerobic digestion in addition to on-site reuse to poplar trees and wetlands for dry season ammonia and temperature Total Maximum Daily Load (TMDL) compliance.

Project Manager; Silverton WWTP and Oregon Garden Wetlands; Silverton OR. Managed innovative wastewater treatment plant expansion and design of wetlands and collection system improvements associated with wastewater management facilities. Complex project included first of its kind wetland discharge permit, wetland construction, and irrigation of a showcase botanical garden, sewer and lift station improvements, peak flow management, treatment plant expansion. $15M construction value

Project Manager; Durham AWWTF Brown Grease Receiving and Cogeneration Project; Clean Water Services; Washington County, OR. Managing project to design and construct a receiving station for brown grease and a new 2 MW cogeneration facility. The $13 million project is expected to be on line in 2014.

Project Manager; Durham AWWTF Headworks Improvements Project; Clean Water Services; Washington County, OR. Managed the design and construction of headworks expansion which cost effectively increased hydraulic capacity from 150-200 mgd in existing channels while improving screening effectiveness. Project included new bar screens, grit classifiers and cyclones, sluice conveyance and washer-compactors. Project has resulted in significant reduction in screenings hauling and associated cost. 2011 PNCWA LCS Project of the Year.

Project Manager; West Basin Facilities Plan; Clean Water Services; Washington County, OR. As a subconsultant, provided wetlands technical input to the recent WBFP update. Input included summary of regulatory requirements, design criteria, conceptual design and implementation plan for Forest Grove and Hillsboro wetlands. Previously was task leader/project manager for the West Basin Facilities Plan, which incorporated the Forest Grove and Hillsboro Facilities Plans and a Reclaimed Water Master Plan.

Education
M.S., Environmental Engineering in Civil Engineering, University of Illinois
B.S., Civil Engineering, University of Illinois

Professional Registrations
Professional Engineer: Oregon (1990, No. 15146); Illinois (1982, No. 062-040923)

Distinguishing Qualifications
⭐ Project Manager Fernhill Phase 1A, Clean Water Services
⭐ 20 year history with Clean Water Services projects
⭐ Project Manager Oregon Garden Wetlands, Silverton, Oregon
⭐ Experience managing complex projects with large design staff and subconsultants
⭐ Experience managing design and construction of wastewater treatment projects with public interface
⭐ Master Gardener, Oregon State University Extension Service

Location: Portland, Oregon
LYNNE CHICOINE, PE

Wastewater Treatment Technical Consultant; Clean Water Services Wetlands Preliminary Design; Washington County, OR. Lynne worked with the wetlands design team providing an interface with the treatment facilities and advising on treatment required for influent into the wetlands planned for the Forest Grove and Hillsboro facilities.

Acting Project Manager; Durham Advanced Wastewater Treatment Plant (AWWTF) Facilities Plan; Clean Water Services; Washington County, OR. Managed completion of final Facilities Plan for the 18 mgd (ADWF) BNR facility. The plan evaluated alternatives for hydraulic expansion and continued biological phosphorus and nitrification to meet stringent Tualatin River discharge limits. The recommended plan provides expanded headworks, chemically enhanced primary treatment (CEPT) and additional tertiary treatment.

Project Manager; Miscellaneous On-call Projects; Clean Water Services; Washington County, OR. Managed tasks that included structural modification of an influent pump station to accommodate Ostara process and filter backwash pipe support analysis and design; feasibility study for development of wetlands for tertiary treatment (nutrient removal); process capacity analysis of Hillsboro and Forest Grove Wastewater Treatment Facilities; development of District standard fine bubble membrane disk diffuser specification.

Project Manager; Wastewater Facilities Plan Update and Collection System Master Plan Update; City of McMinnville, OR. Managed completion of a facilities plan and collection system master plan update and prepared solids stream evaluation and analysis. The 3-mgd (ADWF) treatment plant must provide BPR and nitrification. NTS were evaluated for temperature TMDL compliance. The innovative recommended plan included collection system rehabilitation to limit flow to the plant to eliminate wet weather bypass, expansion of secondary treatment and expansion of the solids treatment process with alternate technologies that would produce Class A sludge.

Project Manager; Technical and Regulatory Support for South Yamhill River TMDL; City of McMinnville, OR. Managing this project and providing support for the City’s wastewater management staff during the development of the South Yamhill temperature Total Maximum Daily Load (TMDL). Work includes advising on data collection and temperature model development and general support during TMDL development.

Project Manager; Columbia Boulevard Secondary Improvements Project; City of Portland, OR. Managed design and construction of complex and highly visible project to maximize capacity of secondary treatment process. The $12 million construction includes upgrading and automating the aeration system including valves and instrumentation, conversion to step feed and contact stabilization operation and conversion to Profinus control platform. Successful operation will defer costly WWTP expansion.

Project Manager; Hillsboro Facility Aeration Basin Improvements; Hillsboro, OR. Managed the design and construction of the Hillsboro Aeration Basin improvements to increase performance and provide BPR and nitrification for future summer operation.
**Linda Macpherson**  
**Public Outreach**

**Relevant Experience**
Linda Macpherson specializes in stimulating new ways of thinking about sustainable water management. She is a senior policy planner, public involvement specialist, and reuse technologist with CH2M HILL, where she is often called upon to develop public education campaigns and policy strategies that build consensus among parties who are grappling with challenging water, wastewater, and environmental quality issues. Linda is based in CH2M HILL's Portland, Oregon, office.

Through her extensive work with environmental education and policy, Linda has developed a keen understanding of how to get people of all ages involved in water stewardship. Her concepts for educational facilities—including interactive exhibits and videos—have engaged the public in unique and exciting new ways and garnered numerous awards. Linda has worked with clients to create public support for such projects as wastewater treatment plant siting and expansion, odor control efforts, and water reuse projects. Her communications approach is to design plans to reach broad audiences; to address a wide range of learning styles by relaying information through a variety of media; tailor the message to address the unique character of local communities; and to recognize the importance of and to incorporate feedback into the process.

**Representative Projects**

**Public Outreach Manager; Wastewater System Improvement Program; City of Albany; Albany; Oregon.** Prepared information for the 2006/2007 Wastewater System Improvement Program including the integrated wetlands reuse project. Coordinated with the Willamette River Partnership to showcase the habitat improvement aspects of this wastewater project.

**Community Outreach Task Lead; Oak Lodge Sanitary District Master Plan; Clackamas County.** Worked with a citizen's committee to develop a managed design process to guide the selection of wastewater treatment plant alternatives.

**Public Outreach Manager, Tryon Creek Wastewater Treatment Plant Enhancement Plan, City of Lake Oswego, Oregon.** Developed and implemented a citizen and stakeholder involvement program, which included a "sounding board" made up of the public, TCWTP staff, key neighbors, and other stakeholders. The sounding board provided feedback on existing odors and on concepts and potential approaches for addressing odors and aesthetic issues, and potential uses and locations for a community building, as well as assisting in developing a phasing plan for recommended improvements.

**Boise Water Visitor Center Interpretive Experience; City of Boise; Boise, Idaho.** Reevaluated and established a concept direction for the visitor experience to create an enhanced understanding of the linkages among citizens, water stewardship, and wastewater treatment. Developed an interpretive experience mission and messages to prepare a visitor center storyline that can inspire the Boise community to invest in the Center. Linda Macpherson then oversaw the design, construction, and installation of 3,600 square feet of exhibits to enhance visitor understanding of the connection between citizen water stewardship and wastewater treatment. The final Boise Watershed Environmental Education Center (BWEEC) includes exhibits that range from static graphic displays to interactive touch-screen kiosks that challenge and inform users on water use and conservation.

**Public Outreach Manager; Wastewater Treatment Plant Location; City of Blaine; Blaine, Washington.** Worked with the City of Blaine to evaluate and develop the public involvement strategy and final plan. Assisted the City to develop a Citizen's Wastewater Outreach Plan.

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**Education**

- Masters of Public Administration, Portland State University  
- B.A., magna cum laude, University of Massachusetts-Amherst (Phi Beta Kappa)

**Distinguishing Qualifications**

- More than 30 years of experience developing public awareness programs for water, wastewater, and environmental quality  
- Globally recognized reuse communications expert and strategist  
- Actively involved in planning and service organizations dealing with water resources issues, including the Water Environment Federation (WEF) Public Education Chair and Communications Task Lead for the Compounds of Emerging Concern Community of Practice (CEC COP), National Association of Clean Water Agencies (NACWA), and the Water Reuse Association Board of Directors, currently serves on the Executive Committee as secretary.  
- Winner of the 2009 Water Reuse Person of the Year award  
- Demonstrated expertise creating consensus among parties involved in challenging issues through planning, policy analysis, and public education and involvement
LINDA MACPHERSON

Advisory Committee to be involved in recommendations to City Council, facilitated meetings, and prepared outreach materials for the public.

Public Outreach Manager; Combined Sewer Overflow Remediation Project; Corvallis; Oregon; 1995. As public outreach manager, created a community values-driven public involvement strategic plan. Required designing a public outreach and decision-making process that ensured a supportable remediation solution was reached. Recognized that public opinion about the project was critical for its success. Developed a plan that provided an understanding of the problem in order for a thoughtful judgment to be made about the solution. Activities involved preparing materials for a citizen's committee and educational materials to develop community understanding. Developed a kiosk with an interactive computer game containing information about causes, locations, solutions, and options for the remediation plan that communicated the work of the citizens committee. The kiosks and computers were placed in public buildings throughout the city, including libraries, schools, and city hall.

Education and Outreach Strategist; Tri-City Service District Wastewater Treatment Plant; Clackamas County; Oregon. Developed a comprehensive water education and outreach strategy with a citizen's advisory committee to generate public interest and support for the facilities plan update. The resulting plan provides amenities (such as odor control) and visual considerations, including a forested floodplain setting of trees, shrubs, bioswales, wetlands, and hiking trails. Developed a video “Good Neighbors: The New Face of Wastewater Treatment,” that won an AMSA award for excellence in environmental education in May 2001. The plant's advanced facility plan won an award from the American Academy of Environmental Engineers in 2003.

Public Involvement Task Leader; Spokane River Use Attainability Analysis; City of Spokane; Spokane, Washington. Led the public involvement and outreach task that involved setting up consultations with tribal governments to assure that the study, scope, and purpose of the effort is responsive to tribal interests. Also led the preparation of posters, displays, and other learning events used to explain the project in a multicultural setting involving tribal interests.

Public Involvement Task Leader; Spokane Riverside Wastewater Treatment Plant; City of Spokane, Spokane, Washington. Prepared the public communication and education enhancement components for the Riverside Aesthetic Master Plan. Worked with the client team and engineers, landscape and building architects to define the community interfaces to the plant.

Public Involvement Task Manager; Columbia Boulevard Wastewater Treatment Plant Facility Master Plan; Portland, Oregon. As public involvement task manager, designed the decision process and facilitated meetings of the Citizen Advisory Committee. Developed "We Care Where it Goes" video, that won AMSA's National Achievement Award in 1996.

Project Manager; Willow Lake Wastewater Treatment Plant Public Awareness Program; Salem; Oregon. Project manager for a public acceptance effort related to land application of biosolids from the plant. Developed a pamphlet and fact sheet to assist the public in developing a positive view of biosolids land application and to minimize public attitudes developed through misunderstanding.
Mark Madison, PE
Quality Control

Relevant Experience
Mark Madison is an internationally known agricultural, environmental, and civil engineer as coauthor of “Design and Operation of Farm Irrigation Systems”, the 860 page design standard for the American Society of Agricultural and Biological Engineers. Mr. Madison has 34 years experience specializing in managing soil, water, plants, and nutrient relationships for wetlands, and upland agricultural production through the use of irrigation. His experience includes site investigation, data collection, modeling, model calibration, design, construction, management, operations, and monitoring and maintenance. He has led design for the oldest treatment wetland research site in Oregon.

Representative Project Experience
Project Manager; Talking Water Gardens Low-Energy Passive Effluent Cooling Project; Albany, OR. A pilot wetland study was used to confirm treatment potential and collect data to assist in permitting. The constructed wetlands remove heat plus treat 26 different effluent constituents that were proven to have a synergetic treatment benefit. The proprietary CH2M HILL treatment wetlands model was used to accurately predict performance.

The 37-acre wetland is the nation’s first constructed wetlands designed to further treat a unique combination of treated municipal wastewater directly blended with industrial effluent. The wetland will polish the water to remove metals and nutrients to levels that allow river discharge through the existing outfall as well as hyporheic discharge of 10 percent of the flow. The wetland system will also function to educate and inform the public (the “talking waters”) and the regulatory community about the benefits of wetlands treatment to reduce thermal loads and other pollutants. OSU uses the wetland for a living laboratory and as a subject for senior design projects and graduate research. The project was awarded federal stimulus funding and the highest honor nationally from the American Academy of Environmental Engineers.

Subject Matter Expert (SME); Natural Reclamation System (NRS) for Phosphorus Removal; Roseburg Urban Sanitary Authority (RUSA); Roseburg, OR. Provided technology input to develop the nation’s first large-scale NRS to remove phosphorus from municipal effluent to below 0.05mg/L. The 340-acre farm owned by RUSA uses constructed wetlands, overland flow, and 60 acres of restored natural wetlands for infiltration of effluent into clay soils that bind phosphorus. The NRS discharges into an ephemeral stream from the hyporheic zone along both sides of the stream with more than three miles of diffuse stream bed hyporheic springs. The NRS removes about 100 pounds per day of phosphorus from 5.5 mgd of effluent that was previously discharged directly to the South Umpqua River. The NRS is a landmark project in that the restoration of the natural wetlands with effluent provides both treatment and mitigation credits for the uplift in ecosystem function and habitat benefits.

Principal Engineer; Williamson River; River Delta Restoration Alternatives; The Nature Conservancy, Upper Klamath Lake; OR. Principal engineer for evaluation of alternatives to restore the Williamson River Delta in Klamath Lake to historic wetland conditions for endangered species fish spawning and rearing. Evaluated impacts of flooding, sedimentation, and agriculture on water quality and habitat values.

Project Manager; Sycan Marsh Restoration; The Nature Conservancy; Beattie, OR. Managed design and construction services to facilitate restoration of the original hydrology and native plant communities of the 25,000-acre Sycan Marsh in the headwaters of the Klamath River. Permitting and construction of three large water control structures in the 600 cfs Sycan River. Tasks included landowner coordination, site survey, hydrology and soils evaluations, hydraulic modeling, hydraulic control structure design, services during construction, and post-construction performance evaluation.

Education
B.S., Agricultural Engineering
A.S., Production Agriculture (Irrigation Emphasis)

Professional Registrations
Professional Agricultural, Environmental, and Civil Engineer: OR

Certified Water Rights Examiner: OR

Distinguishing Qualifications
★ 34 years experience studying, designing, and building irrigation, land application, and natural treatment systems
★ Helped write new wastewater reuse regulations for the Oregon Department of Environmental Quality (DEQ)
★ National expert in design of constructed wetlands for wastewater quality improvement that also have mitigation credits
★ Managed four national award-winning effluent wetlands and reuse projects that enhance water quality and improve habitat

Location: Rio de Janero, Brazil
MARK MADISON, PE

SME; Demonstration Natural Reclamation System (NRS); City of Salem; Salem, OR. Designed a wetland treatment demonstration project that compares three NRS technologies: overland flow wet meadow wetlands, vertical flow subsurface wetlands, and surface flow wetlands. The wetlands treat summer temperature, phosphorus, and ammonia, and create new wildlife habitat. The project also provide a source of class A agricultural and golf course reuse water, in conjunction with the Title 16 U.S. Bureau of Reclamation program which funded 25 percent of the construction cost. This system has been in operation for 10 years and has the most robust data set on treatment wetlands operations and water quality in Oregon.

SME; Wetland Treatment Demonstration Project; Pope & Talbot; Halsey, OR. Managed design, construction, and startup. Project developed with OSU as a field laboratory for demonstration and research in wetland treatment technology. This project was built 22 years ago and is the oldest treatment wetland research site in Oregon. Multiple OSU graduate students have done research at this treatment wetland resulting in advanced degrees and expanded knowledge specific to treatment wetlands in Western Oregon. The system includes water control structures and ten separate wetlands with variable flow rates and plant management regimes. One cell is a subsurface flow wetland with rock media. The system reuses paper mill effluent and polishes it before river discharge.

SME; Wetlands for Phosphorus Removal; City of Boise, ID. Developed a Wastewater Facilities Plan Amendment that evaluated constructed wetlands for cooling, effluent polishing, and phosphorus removal for the West Boise wastewater reclamation facility. Evaluated innovative constructed treatment wetlands with hyporheic discharge and soil treatment to allow no surface discharge.

SME; Treatment Wetland System Feasibility Review; South Suburban Sanitary District; Klamath Falls, OR. Feasibility review/conceptual design for treatment wetland construction next to municipal wastewater treatment facilities to polish effluent before river discharge.

SME; Tualatin River Wetlands Mitigation; Hillsboro Landfill; Waste Management, Inc.; Hillsboro, OR. Wetland restoration and creation as mitigation for landfill expansion in the floodplain. Project included design, construction oversight, and monitoring.

SME; Treatment Wetland Hyporheic Research; Woodburn, OR. Provided site evaluation, design, and construction services for a hyporheic discharge research wetland that was precisely monitored by OSU researchers to establish design criteria for hyporheic discharge specific to Western Oregon.

SME; Wetland Predesign; Clean Water Services; Hillsboro, OR. Sited, designed, and provided field investigation oversight for a 350-acre wetland complex for water cooling and phosphorus and ammonia removal. The predesign included meeting with stakeholders and regulators. A peat filter cell was modeled to enhance metals removal followed by a series of treatment wetlands to further filter, polish, and cool the water.

SME; Wetland Design; Clean Water Services; Forest Grove, OR. Technology input for design of the Phase One treatment wetlands at Fernhill. Evaluated subsurface flow wetlands for metals removal and hyporheic discharge for a portion of the total flow to remove additional phosphorus provide diffuse flow.
**Peggy O’Neill, PWS**

**Permitting**

**Relevant Experience**

Peggy O’Neill is an environmental scientist with CH2M HILL’s Water Business Group (WBG) in Portland, OR. She has 14 years of experience coordinating, leading, and conducting biological investigations. Her experience includes regulatory compliance; wetland delineation, mitigation, and monitoring; stream and wetland restoration; resource inventories; feasibility studies; site selection, planning, and design; NEPA and SEPA documentation; environmental assessment and environmental impact statement documentation; and rare plant surveys. She has been responsible for federal, state, and local natural resources permitting for projects with the potential for impacting wetlands. In this capacity, she worked closely with the U.S. Army Corps of Engineers, Oregon Division of State Lands, Washington Department of Ecology, and numerous local agencies throughout Oregon and Washington. She has also been responsible for development of wetland compensatory mitigation and monitoring plans, functional assessments of freshwater wetlands, and collaborating in the design of wetland site enhancements and construction for habitat and water quality benefits.

Ms. O’Neill has extensive experience in riparian and wetland habitat assessment and in protocol-level surveys for sensitive plant species. She has been integral in developing action plans for protection of wetlands, riparian, stream, and other sensitive habitats from impacts associated with urban development, highway improvements including bridge replacements, and siting of wind energy facilities. Her responsibilities include public presentation of study results to coordinating agencies as well as to citizen groups.

**Representative Project Experience**

**Environmental Task Lead; Natural Treatment Wetlands Project; City of Woodburn, OR.** Coordinated environmental investigations and permitting for design of natural treatment wetlands at the Woodburn, Oregon wastewater treatment plant. Conducted investigations for sensitive plant and wildlife species. Provided senior review for wetlands delineation and assessment. Participated in coordination and informational meetings with client and regulatory agency personnel. Currently preparing conceptual mitigation plan and completing applications for state and federal wetlands permits.

**Environmental Task Lead; Natural Treatment Wetlands Project; Clean Water Services; Hillsboro, OR.** Coordinated environmental investigations including wetland delineation and assessment for pre-design of natural treatment wetlands at wastewater treatment plants in Forest Grove and Hillsboro, OR. Conducted investigations for sensitive plant and wildlife species. Provided senior review for wetlands delineation and assessment. Participated in coordination and informational meetings with client and regulatory agency personnel.

**Permit Specialist/Wetlands Scientist/Botanist; Albany-Millersburg Joint Water System; OR.** Performed wetland delineation on 107-acre city-owned site and for 3.2 miles in a 50-foot corridor along Century Drive in the Albany-Millersburg area. Purpose of the wetland delineation was compliance with permit requirements of Section 404 of the Clean Water Act and the Oregon Removal-Fill law to facilitate construction of a joint water system include a new intake structure in the South Santiam River to serve the two towns. Conducted a complete survey for sensitive plant species identified as potentially occurring in the area. Prepared a Joint Removal-Fill permit.

**Location:** Portland, Oregon

**Education**

M.S., Environmental Sciences and Resources (Plant Ecology), Portland State University
B.A., Portland State University
B.S., Earth Science, Western Oregon University

**Professional Registrations**

Professional Wetland Scientist, (Society of Wetlands Scientists, 2005)

**Distinguishing Qualifications**

- Successful management of biological field teams on large, complex projects
- 14 years experience conducting biological investigations including riparian corridor assessments, wetland delineations, vegetative analyses, botanical surveys, habitat assessments, and threatened and endangered species evaluations
- 12 years experience preparing federal, state (Oregon, Washington) and local permits for removal-fill activities, including use of SLOPES programmatic biological opinion process
- Commitment to coaching/mentoring/training junior staff in biological investigations, wetlands delineation, and environmental permitting
- Researched and implemented biological control for invasive plant species on wetland mitigation site
- Developed and maintained extensive database of plant species including, description, habitat, threatened and endangered species information, wetland indicator status, and project information

**Location:** Portland, Oregon
application, including coordination with the appropriate jurisdictional agencies. Prepared a technical memorandum detailing mitigation options, including timelines, and estimated installation costs.

**Environmental Task Lead; Treatment Wetlands Project; City of Albany, OR.** Provided task management and oversight of environmental investigations and permitting. Provided technical expertise for development of planting plan for treatment wetlands. Participated in meetings with project engineers, client, and agency personnel to present this project and to propose an “advance mitigation” concept to address mitigation requirements for future city projects.

**Environmental Task Lead; Treatment Wetlands Project; Roseburg Urban Sanitary Authority (RUSA); Roseburg, OR.** Coordinated environmental investigations and permitting activities for 180-acre natural treatment wetlands project. Provided scientific expertise to project engineers to assist in development of constructed wetlands for water quality treatment. Developed plans for enhancement of existing wetlands and construction of additional wetlands for habitat and water quality benefits. Prepared planting plans and construction specifications. Conducted protocol-level surveys for rare plants. Prepared information for and participated in multiple planning meetings with project engineers, regulatory agency personnel, and client. Lead the effort to secure “advance mitigation” credits for wetland enhancement and creation that was beyond that needed for project mitigation.

**Permit Specialist/Project Biologist; Tualatin Valley Water District; Portland, OR.** Conducted assessments of wetlands and vegetated corridors on project site and adjacent areas. Prepared a Natural Resources Assessment and Tier 2 Analysis to support application for Washington County Clean Water Services Service’s Provider Letter. Prepared state and federal removal fill permit applications. Provided input to project design engineers to minimize impacts to wetlands and vegetated corridors. Designed mitigation plans for impacts to wetlands and vegetated corridors to meet permit requirements. Provided coordination with federal, state, and local regulatory personnel.

**Wetlands Scientist; I-5 Graves Creek Bridge Replacement; ODOT; Josephine County, OR.** Performed wetlands delineation and habitat assessment; used SLOPES biological opinion for determination of compliance (for permitting purposes) and prepared state and federal wetlands/waters removal-fill permit applications. Also developed revegetation plan and conducted construction monitoring.
Vince Rybel, PE
Outfall & Mixing Zone

Relevant Experience

Mr. Rybel is a geotechnical engineer who has more than 28 years of ocean outfall and related marine pipeline design and construction experience on over 25 major outfall projects. His work with pipeline river and bay crossings on five projects using a horizontally drilled directional method includes a former world record bore made in Virginia. He has prepared geotechnical site reports for numerous projects and has participated in the design and construction of a variety of other civil engineering projects. Mr. Rybel also has extensive experience with submerged pipelines, dams, wastewater facilities, hydroelectric projects, and geotechnical site reports containing foundation design and construction recommendations. These projects have been completed for various public and private facilities along the West Coast.

Representative Project Experience

Lead Engineer, Tri Cities Outfall Modifications, Oregon City, Oregon. Lead engineer for fitting Check valve on end of existing outfall for improved dilution during low flows.

Lead Engineer, Netarts Bay Outfall Repair, Oceanside, Oregon. Lead engineer for diffuser repairs to existing horizontal directional-drilled outfall off the Oregon coast.

Design Engineer, Seaside WWTP Outfall Replacement Project, Seaside, Oregon. Design engineer for replacement of outfall and diffuser; 1,100-foot-long, 32-inch-diameter HDPE outfall and 3-port diffuser (Tideflex ports) in the Necanicum River and tidal estuary.

Lead Engineer, Ponce Ocean Outfall Repair, Ponce, Puerto Rico. Lead Engineer for repair of leaks 2 miles offshore in over 200-foot water depth.

Lead Engineer, Boise Cascade Outfall Extension, St. Helens, Oregon. Lead engineer for design and construction of 600-foot-long extension to existing 48-inch-diameter outfall for a large paper mill near St. Helens, Oregon. Outfall discharged to the Columbia River in an area where large sand waves move across the river bottom.

Senior Reviewer, Taylor Water Treatment Plant Outfall Extension and Upgrade, Corvallis, Oregon. Provided senior review for outfall upgrades for the 21-mgd Taylor WTP on the banks of the Willamette River. Scope of work included extending the outfall and adding diffusers and a foam and air control chamber.

Project Manager, McKenzie River Outfall, Weyerhaeuser Paper Company, Springfield, Oregon. Managed design and construction of improvements to a 15-mgoutfall owned and operated by the Weyerhaeuser Paper Company on the McKenzie River in Springfield, Oregon. The McKenzie River is a blue-ribbon trout stream, and the outfall is in an extremely sensitive area. Directed an evaluation that included a river survey measuring currents and depth and computerized dilution modeling. Responsible for the design of a new diversion structure, pipeline and diffuser that greatly reduced visual impacts and provided better thermal dilution. In addition, the design had several novel concepts to greatly reduce foam and air entrainment. Also assisted Weyerhaeuser staff in overseeing construction at the very difficult construction site.

Senior Reviewer, Tryon Creek Outfall, City of Portland, Oregon. Provided senior review for this project. The 300-foot-long, 36-inch-diameter outfall was designed and constructed at the City of Portland’s Tryon Creek Wastewater Treatment Plant on the Willamette River in Lake Oswego. The outfall was constructed in approximately 70 feet of water and includes three separate multi-port diffusers. Significant concerns on the project were dilution of residual chlorine and ammonia in the Willamette River.

Education

MS, Civil Engineering (Geotechnical)
BS, Civil Engineering

Professional Registrations

Professional Civil Engineer: Oregon (No. 8849), Washington (No. 25956)
Professional Geotechnical Engineer: Oregon (No. 08849PE)

Distinguishing Qualifications

★ 41 years of geotechnical and general civil experience with an emphasis on marine and underwater projects, including project and construction management for water, wastewater, hydro and wind power projects
★ More than 28 years of experience with outfall projects
★ Design and construction engineer for the Tri-City WPCP and Boise-St. Helens Outfall Extension and Diffuser Replacement Projects
★ Leader in expediting fast-track design-construction projects
VINCE RYBEL, PE

Design Engineer, Weyerhaeuser Paper Company Outfall, Springfield, Oregon. Led design and construction of a 100-foot-long, 30-inch-diameter diffuser in the McKenzie River near Springfield.

Design and Resident Engineer, Newport Outfall, Newport, Oregon. Design and resident engineer for 24-inch-diameter, 750-foot-outfall extension into surf zone.

Lead Engineer, Port Gardiner Outfall, Kimberly Clark Company, Everett, Washington. Lead engineer for nearshore portion of 42-inch-diameter, 1,800-feet-long outfall.

Design Engineer, Texaco Refinery Outfall, Anacortes, Washington. Design engineer for addition of a 200-foot-long, 24-inch-diameter diffuser to an existing outfall.

Design Engineer, Reichhold Chemical, Inc. Outfall, Tacoma, Washington. Design of a 100-foot-long, 6-inch-diameter outfall into Blair Waterway near Tacoma.

Lead Engineer, Kingston Outfall, Kitsap County Department of Public Works, Kingston, Washington. Lead engineer for design of 18-inch-diameter, 5,400-foot-long outfall entry in 160 feet of water.

Assistant Design Engineer, Commencement Bay Outfall, Tacoma, Washington. Assisted in predesign and final design efforts for 54-inch-diameter outfall 3,000 feet long, 120 feet deep.

Lead Engineer, Monterey Bay Outfall, Ballast Rock Stability Assessment, Monterey Regional Water Pollution Control Agency, Monterey, California. Coordinated study to reassess stability of ballast rock in near shore environment.

Assistant Design Engineer, Terminal Island Outfall, Los Angeles, California. Assisted in the predesign phase of the 5,000-foot-long, 72-inch-diameter outfall through Los Angeles harbor.

Lead Engineer, Agingan Point Outfall, Commonwealth Utilities Corporation, Saipan, Marianna Islands. Lead engineer for design of a 24-inch HDPE outfall, 1,100 feet long, installed by HDD methods. Outfall will discharge into Tiniau Channel.
Jason Smesrud, PE
Project Manager

Relevant Experience
Mr. Smesrud is a principal technologist with CH2M HILL’s Water Business Group based in Portland, Oregon. He has more than 15 years of experience providing technical expertise and leadership to water resources and natural treatment systems projects and has been involved in all phases of project planning, permitting, design, construction, and operations. Mr. Smesrud is a recognized irrigation and natural treatment systems expert with experience on more than 50 projects involving agricultural, forestry, and landscape reuse of wastewater and residuals and engineered wetlands for water quality enhancement.

Representative Project Experience
Design Manager; Woodburn WWTP Poplar Tree Irrigation and Natural Treatment System; City of Woodburn, OR. Managed a multi-disciplinary design and permitting team through final design and contract document preparation of a new Pudding River outfall, 25 acres of poplar tree irrigation, 28 acres of constructed wetlands, 10 million gallon irrigation regulating reservoir, pumping, conveyance, SCADA, and water control structures to meet discharge limitations for temperature and ammonia. Work involved multi-agency coordination and securing permits for construction.

Project Manager; Woodburn WWTP Natural Treatment Systems Pilot Studies; City of Woodburn, OR. Coordinated the efforts of research teams from OSU, WSU, and CH2M HILL for pilot studies investigating: high rate irrigation for groundwater recharge; thermal reduction and hyporheic discharge to a river system from a leaky constructed wetland; coppice management of a hybrid poplar tree plantation; and ammonia treatment through a horizontal subsurface flow wetland system.

Senior Consultant; Talking Waters Garden Constructed Wetlands; Albany, OR. Led the thermal evaluations for temperature TMDL compliance to support the City in regulatory negotiations and to support the design team in determining necessary wetland areas, volumes, and configurations for effective effluent cooling. A key part of this work included developing a dynamic energy balance, hydraulic, and temperature model (Heat Source Wetlands) for the application to wetland systems.

Drainage Design Manager; Roseburg Urban Sanitary Authority (RUSA) Natural Treatment Systems Project; Roseburg, OR. Performed soil investigations for soil infiltration and drainage characteristics, developed design criteria for sprinkler systems and drainage facilities, and managed the drainage design for this 340-acre ranch irrigated with recycled water for phosphorus and temperature control through hyporheic discharge.

Design Manager; Belfair Forestlands Irrigation Reuse Project; Mason County, WA. Managed the design of a 90-acre spray irrigation system for reuse of Class A recycled water to irrigate commercial forestlands. Project components included sizing combined storage (185 acre-ft) and irrigation (95 acre) areas, designing the irrigation land application system, and supporting the project through construction.

Senior Consultant, Natural Treatment Systems Basis of Design Report; Clean Water Services of Washington County, OR. Developed temperature evaluations of heating and cooling through the planned series of wetlands and ponds at the Forest Grove (Fernhill) and Hillsboro (Davis Tool and Jackson Bottoms) sites using the Heat Source Wetlands model. Also provided senior review and guidance for soil and hydrogeologic evaluations.

Education
M.S., Bioresource Engineering
B.S., Soil Science

Professional Registrations
Professional Engineer: OR, WA
Certified Water Rights Examiner: OR

Distinguishing Qualifications
★ Over 15 years of experience on more than 50 natural treatment system projects in Oregon and across the West
★ Proven success in designing and delivering complex thermal control wetland projects and managing multi-disciplinary permitting and design teams including outfalls and natural treatment systems with effective stakeholder communications
★ Developed the Heat Source Wetlands model for design and analysis of wetland water cooling (utilized on projects for Albany, Woodburn, Stockton, Boise, Willamette Partnership and Stockton)

Location: Portland, Oregon
JASON SMESRUD, PE

Senior Consultant; Stockton WWTP Effluent Pond and Constructed Wetland Temperature Evaluation; Stockton, CA. Used the Heat Source Wetlands model to evaluate the effect of effluent storage pond and constructed wetland cell operations on ultimate river discharge temperatures.

Senior Consultant; Boise WWTP Temperature Compliance Evaluation; Boise, ID. Led the evaluation of effluent cooling opportunities from the use of existing gravel mining ponds and future constructed wetlands around the WWTP. The Heat Source Wetlands model was used to quantify cooling and excess thermal load reduction benefits from both facilities.

Senior Consultant; South Truckee Meadows Water Reclamation Facility Reuse Expansion Master Plan; Reno, NV. Led the master planning services for doubling the capacity of reclaimed water storage and distribution facilities from the existing 2,600 acre-ft/year capacity while balancing future water supply and demands.

Project Manager; Industrial Wastewater Irrigated Reuse Pilot Study; City of Dallas, OR. Managed the monitoring, reporting, and groundwater investigations for this 3-acre reuse pilot study where poplar trees were irrigated with industrial wastewater. Also served as design engineer for the irrigation system (storage lagoon, automated pump and filtration station, and spray application system) and designed a vadose zone monitoring array and subsurface tile drain monitoring systems to track movement of water and solutes into the soil and as discharged through tile drains.

Agricultural Engineer; Jeddah Sewage Lake Project; KSA National Water Company; Jeddah, Saudi Arabia. Senior consultant for agricultural use of water and sediments produced through dewatering of a 2-square-kilometer sewage lake. Spent 3 weeks in-country developing plans for safe utilization of sediments and reclaimed water on tree plantations surrounding the lake and for in-place soil improvement. Project won the 2010 Global Water Intelligence reuse project of the year award.

Agricultural Water Conservation Lead; Hawaii Water Conservation Plan; USACE Honolulu District; HI. Led agricultural water conservation efforts for a joint project with USACE and the Hawaii Commission on Water Resources Management to develop a statewide water conservation plan. Work included leading advisory group workshops, stakeholder focus sessions, statewide agricultural water use analysis, development and ranking of BMPs, and implementation and funding strategies.

Agricultural Engineer; Cellulosic Ethanol Feedstock Farm Development; TX. Led soil investigations, irrigation design criteria, and developed land grading designs for furrow irrigation of 1,600-hectares of cropland being converted from rice to energy cane biomass cropping.

Senior Consultant; Willamette Partnership Ecosystem Credit Trading Marketplace; Salem, OR. Developed a thermal credit screening tool to assess thermal credit trading opportunities through wastewater reuse, water rights transactions, and cooling through wetland systems.

Project Manager; Hermiston Generating Power Plant Cooling Water Irrigated Reuse; Echo, OR. Conducted permit negotiations with Oregon DEQ and prepared OM&M plan modifications and annual reports over two cropping years for the blended cooling water irrigation program over 700 acres of commercial food and forage crop land.
David Wilson  
Outfall & Mixing Zone

Relevant Experience
Mr. Wilson is a senior technologist specializing in the evaluation and design of wastewater discharges. He serves as the technical lead for water quality studies, modeling analyses, and conceptual designs of wastewater discharges including existing discharges, alternative discharge designs, and new discharges sites. He focuses on environmental analysis, with a specialty in NPDES permit negotiation and compliance issues. Mr. Wilson is a recognized leader in the Pacific Northwest for outfall mixing studies and design improvements, as well as analyses of water and sediment quality issues. These studies have included point and non-point sources for nutrients, metals, and thermal impacts. His particular skills are regulatory strategy development, agency negotiations, study design and implementation of field data collections, design of modeling analyses, statistical analysis, knowledge of aquatic communities, and project management. He has conducted dilution modeling analyses to evaluate compliance with water quality standards, including many thermal discharges. He has designed and directed more than thirty-five outfall dilution studies for river, estuarine, and marine dischargers.

Representative Project Experience

Technical Lead, Kellogg Creek WPCP Outfall Improvement and Ammonia Compliance Project, Clackamas Service District No. 1. Technical lead for concept development of outfall improvement options, dilution modeling, water quality compliance assessment, and field inspection of the Kellogg Creek WPCP outfall in the Willamette River. Screening-level assessment evaluated three outfall options including extension down-slope with new diffuser at depth. Technical analyses to develop approach to comply with water quality criteria based on existing and projected maximum effluent ammonia discharge values. An extended outfall and new diffuser was shown as reliable approach to meet dilution requirements (with safety factor).

Diffuser Lead, Tri-City WPCP Outfall Remediation Project, Clackamas Tri-City Service District, Oregon City, Oregon. Task lead for development of diffuser improvements to Tri-City WPCP outfall (Willamette River) for effluent ammonia discharges to comply with ammonia criteria in Oregon water quality standards. This time-critical project (conducted to meet MAO), evaluated ammonia compliance approaches with simple improvements to existing three-port outfall diffuser, along with new outfall and diffuser options. The solution selected by the District was a combination of diffuser port modification, dry season flow control into the modified outfall, and ammonia treatment. The engineering documents and construction were completed within the MAO timeline in 2012, and effluent ammonia limits were eliminated from the Tri-City WPCP permit.

Project Lead, Mixing Zone and Dilution Studies, Clean Water Services, Tualatin River, Oregon. Designed and directed field data collections and outfall inspections, and led modeling and report development for this study which was developed and completed in accordance with the DEQ’s new Regulatory Mixing Zone – Internal Management Directive (RMZ-IMD). Work included outfall inspections, field data collections at all outfall sites, discharge flow modeling to represent season river flows and stages, dilution modeling, environmental mapping, and reporting.

Task Lead, Outfall Extension and Diffuser Replacement Project (Columbia River), Boise Cascade and City of St. Helens, Oregon. Task leader for environmental studies and design development of an extension of the existing outfall and new replacement diffuser section in the Columbia River. The extended outfall and new diffuser was designed to meet dilution requirements, to move the plume offshore into the main river channel, and to eliminate potential impacts to migratory salmon. The outfall diffuser was designed to provide dilutions that will meet Oregon's new temperature standards under all discharge conditions. He directed field studies, dilution modeling analyses, diffuser designs, and development of the engineering report. This unique cooperative project between an industry and municipality was completed (studies, permitting, design, and construction) in 18 months and began service in November 2006.

Education

MS, Marine Sciences, 1978
BS, Zoology, 1975

Distinguishing Qualifications

★ Technical lead for the design and development of many new outfalls and diffuser improvements.
★ More than 30 years of experience designing and directing studies to assess wastewater and temperature discharge impacts and water quality compliance
★ Extensive experience working in Oregon, including recent outfall work for Clackamas County (Tri-City, Hoodland, and Kellogg Creek Outfalls), Albany, MWMC, Portland, Seaside, Salem, McMinnville, Troutdale, Woodburn, and others.
★ Lead negotiator for NPDES permit projects for clients throughout the Northwest.
DAVID WILSON

Project Lead, Mixing Zone Study and New Outfall Conceptual Design, City of Woodburn, Pudding River, Oregon. Designed and directed field data collections and outfall modeling and report development for this study which was developed and completed in accordance with the DEQ’s new Regulatory Mixing Zone – Internal Management Directive (RMZ-IMD). Work included site-selection and outfall design concepts for a new wetlands outfall to address temperature limitations during the dry season.

Project Lead, Mixing Zone and Dilution Studies, City of Redding, Sacramento River, California. Designed and directed field dilution study, modeling, and report development for evaluation of two new outfall diffusers designed by CH2M HILL. This study was developed and completed in accordance with the requirements of the Central Valley Regional Board. Work included outfall inspections, field data collections at all outfall sites, discharge flow modeling to represent season river flows and stages, dilution modeling, environmental mapping, and reporting. The study results were used to define the mixing zone boundaries and dilution ratios for the dry and wet weather diffusers for the Clear Creek WWTF.

Project Lead, Outfall Dilution Study and Diffuser Operation and Management Plan; City of Albany, Oregon. Led field dilution study, modeling, and reporting to demonstrate that the City of Albany’s wastewater discharge to the Willamette River complied with State Water Quality Standards under all conditions. In addition, an outfall diffuser performance, operation, and management plan was developed to allow the City of Albany to plan outfall port configuration changes to match future effluent flows. Albany’s Wastewater Treatment Plant discharges effluent into the Willamette River near river mile 115. He designed and directed field performance studies and modeling of the 96-foot outfall diffuser, including: detailed field measurements of effluent concentrations (using a dye tracer) and receiving water temperatures within and at the boundary of the defined mixing zone, under low flow receiving water conditions; dilution modeling for the field-measured conditions and 7Q10 river conditions; and an evaluation of effluent compliance with the state water quality standards.

Lead Diffuser Design, Marine Park WRF Outfall Diffuser, City of Vancouver, Washington. Lead for diffuser design and environmental studies of a new 48-inch-diameter, 180-feet-long outfall diffuser into the Columbia River.

Lead Environmental and Diffuser Design, Kimberly-Clark Company & City of Everett, Port Gardiner Replacement Outfall and Diffuser, Everett, Washington. Lead for diffuser design and environmental studies and permitting for new 42-inch-diameter, 1,800-feet-long outfall into 350 depth in Port Gardiner Bay.

Lead Environmental and Diffuser Design, Texaco Refinery Outfall, Anacortes, Washington. Lead for diffuser design and environmental studies and permitting for a new 200-foot-long, 24-inch-diameter diffuser to an existing outfall.

Lead Diffuser Design, Seaside WWTP Outfall Replacement Project, Seaside, Oregon. Lead diffuser design and field data collections for replacement of existing Seaside outfall with new outfall and diffuser. Led siting studies and agency communication for design of 1,100-foot-long, 32-inch-diameter HDPE outfall and 3-port diffuser (Tideflex ports) in the Necanicum River and tidal estuary.


Senior Technical Lead, Multiple Outfalls Dilution Evaluation and NPDES Permit Assistance, City of Corvallis. Extensive dilution modeling analyses were performed using the model UDKHDEN and a range of model cases to represent the two multiport outfall diffusers in the Willamette River. Special analyses were developed to represent the overlapping plumes of the existing and proposed turreted, multiport diffusers. Evaluation of effluent compliance with state water quality standards demonstrated that effluent metals limits were not required. Oregon DEQ is using the Technical report to develop the NPDES permit and Fact Sheet.

Task Lead, Outfall Diffuser Air Release Evaluation and Repair Concepts; Willow Lake Water Pollution Control Facility Outfall (Willamette River), City of Salem, Oregon. Responsible for leading CH2M HILL’s hydraulic experts (Dr. Loren Davis and Roger Lindquist) in the evaluation, analyses, and conceptual design of repairs to the Salem outfall diffuser to address air entrainment and air releases from nearshore ports. Field measurements and recordings inside the bankside manhole were used along with the design drawings to develop hydraulic analyses of the flows plunging into the diffuser section. Computational Fluid Dynamics (CFD) modeling was used to represent and evaluate the effluent flows plunging into the diffuser section. A total of eight repair concepts were developed and one specific repair concept was recommended along with a cost estimate. CH2M HILL also reviewed the issue of debris and sediment deposition along the new outfall diffuser, and provided concepts to address the issue.

Technical Lead, Outfall Dilution Study, City of McMininville, Yamhill River, Oregon. Dilution and temperature modeling analyses were conducted to evaluate potential changes in the facility discharge operations that could reduce temperatures at the mixing zone boundaries. These analyses included field dilution measurements and modeling, comparison of model predictions with historical field temperature measurements, and an evaluation of the discharge compliance with water quality chemical criteria.
James Bledsoe, PE
Project Engineer

James Bledsoe brings 16 years of water and wastewater experience to the project team. His experience includes wastewater planning, design, and construction management services. He manages the water resource group of Keller Associates corporate office, and oversees all work completed in Oregon.

Prior to joining the Keller team, James worked as the technical support manager for three internationally used civil engineering software packages. His planning experience is augmented by his project management experience in the design and construction management of utility improvements.

James measures his success by the satisfaction of repeat clients including Ashland, Wilsonville, Stayton, Oregon and Boise, Meridian, Nampa, and Mountain Home, Idaho. Representative projects include:

- Project manager/engineer for numerous Boise sewer collection system projects
- Ashland Comprehensive Sanitary Sewer Master Plan; coordinated evaluation of disposal options, including shading plan; evaluated maintenance management software; evaluated SCADA system; staffing analysis support; oversaw assessment of pumping facilities
- Served as Owner’s Representative for the Stayton Mill Creek Lift Station and Pipeline Design-Build Project
- Hydraulic modeling and planning for Wilsonville, Sheridan, Gates, Wood Village, Ontario, Moscow, Burley, Jerome, Nampa, Rexburg
- Project manager for Mountain Home Facility Planning Study, West Interceptor, 5th West Interceptor, and lagoon piping projects
- Nampa West Regional Lift Station and Pipelines, Karcher Lift Station and Pipelines, and pipeline projects for the displacement of Lift Stations 4 and 6
- Project manager/engineer for Nampa Regional lift stations
- Funding support for numerous DEQ SRF loan projects, USDA-RD projects, Department of Commerce grants, Idaho State Bond Bank funding, and congressional special appropriation grants
- Project manager/engineer for Idaho Power Pump Station and 9 Mile Transmission Pipeline Project. Project designed in six months

Education:
MS, Civil Engineering
Summa Cum Laude
Brigham Young University

Years of Experience:
16 Years

Professional Engineer Registrations:
Idaho – 10803
Oregon – 73454PE
Washington – 43984

Work Experience:
1999 – Present, Keller Associates, Meridian, ID
David Primozich
Senior Director of Ecosystem Services
primozich@thefreshwatertrust.org

David Primozich is a leading expert on water quality trading and environmental accounting in the United States. He has more than a decade of experience working with private and public entities on regulatory compliance related to water quality and endangered species. At The Freshwater Trust, David leads efforts to quantify environmental improvements that result from land and water management actions in new and relevant units, making it possible for regulated entities to secure permits for water quality trading and help grant makers improve the effectiveness of conservation investments.

David has a long history of experience helping people make decisions about management and use of natural resources. Prior to joining The Freshwater Trust, he served as Executive Director of the Willamette Partnership, where he helped shape emerging measurement science and tracking procedures around ecosystem services to achieve better conservation results. He served as Coordinator for Yamhill County Parks, where he managed community engagement and production of the County’s first Parks and Open Space Plan. Prior to developing this Plan, David led an extensive community engagement process associated with new regulations affecting the use of streamside lands in Tillamook County, Oregon. In addition to the Willamette Partnership, David has helped to form two nonprofit entities dedicated to community engagement and private land management.

Experience
The Freshwater Trust, Portland, OR
Senior Director of Ecosystem Services, 2010-present
- Created and manages the Ecosystem Services department to advance The Trust’s restoration mission through conservation measurement science and performance tracking
- Leads The Trust’s interaction with regulated entities seeking to apply quality standards and secure permits for water quality trading and mitigation programs
- Leads The Trust’s engagement with natural resource and regulatory agencies associated with water quality trading and conservation measurement and performance tracking
- Represents The Trust in national policy discussions related to water quality trading
- Member of Senior Staff responsible for The Trust’s strategic direction, policy development, and external communications

Willamette Partnership, Salem, OR
Executive Director, 2004-2010
- Helped form the Willamette Partnership, a coalition of conservation, business, and science leaders in the Willamette River basin to develop market-based tools for conservation
- Responsible for strategic direction and external communications and representation.
- Secured approval from stakeholders in Oregon, including regulatory agencies, on a package of credit standards and protocols—the first agreement of its kind in the country

Willamette Restoration Initiative, Salem, OR
Project Coordinator, 2003-2004
- Led organization-wide effort to develop a comprehensive restoration strategy to address water quality improvements, flooding, fish and wildlife habitat issues, and the overall watershed health of the Willamette Basin
- Developed and implemented new approaches to engage private landowners in natural resource policy making focused on riparian protection

Yamhill County, McMinnville Oregon
Parks Coordinator, 1999-2003
- Managed eleven-member Parks Board of appointed community representatives that advised County Commissioners on Parks Department operations and management
- Managed fundraising and completion of comprehensive Plan for Parks and Open Space in one of the fastest growing counties in Oregon
- Successfully managed broad stakeholder communities through contentious land use and planning negotiations
Education
M.A. Applied Anthropology, Oregon State University, 2002
B.S. Anthropology, University of Oregon, 1994
A.S. Applied Science-Agriculture, Clark College, 1999

Credit Program Design/Implementation
- City of Medford, Oregon
- City of Ashland, Oregon
- Metropolitan Wastewater Management Commission, Eugene-Springfield, Oregon
- Portland General Electric/Port of St.Helens, St. Helens, Oregon
- City of Boise, Idaho
- Idaho Power Company, Boise, Idaho
- Oregon Watershed Enhancement Board

Selected Publications
- Dupuis T, Primozich D, Smesrud J, Wirz D. Water Quality Thermal Credit Trading: Methods for Quantifying Thermal
  Credits for Water Quality Trading. The Water Report 52 (June 15, 2008)
- Institute for Natural Resources; Achterman G, Aylward B, Duncan S, LaRocco G, Primozich D, Vickerman S. Policy
- Gilden J, Primozich D, Smith C. Complex Courses from Conflict to Action: A Riparian Management Case. Oregon Sea
  Grant, Oregon State University, 2002
- Primozich D. Using PLACE Mapping to Improve Tillamook County Riparian Action Planning. This Is Reality and It's

Selected Grants
- Joint Regional Agreement on Best Practices for Water Quality Trading for the Pacific Northwest (Bullitt Foundation,
  2013), $50,000
- Rogue Basin Habitat Restoration Program (Bureau of Reclamation, 2013), $175,000
- Pacific Northwest Water Quality Trading Program – Streamflow Transactions (Kresge Foundation, 2013), $100,000
- Advancing Environmental Markets to Benefit Puget Sound (Boeing Company, 2012), $75,000
- Advancing a Replicable Framework for Environmental Markets in the Pacific Northwest (Bullitt Foundation, 2012),
  $40,000
- Northwest Water Quality Trading Program (Meyer Memorial Trust, 2012), $300,000
- Oregon Environmental Markets Initiative (Compton Foundation, 2011), $25,000
- Conservation Innovations Grant (U.S. Department of Agriculture Natural Resources Conservation Service, 2011),
  Northwest Environmental Markets Initiative, $966,722
- Applying Proven Tools to Advance Ecosystem Markets (Bullitt Foundation, 2010), $50,000
- Oregon Environmental Markets Initiative (Compton Foundation, 2010), $25,000
- Advancing the Role of StreamBank in Oregon’s Developing Environmental Marketplace (Jubitz Family Foundation,
  2010), $25,000
- Catalyzing Environmental Markets (Meyer Memorial Trust, 2010), $150,000

Awards
- U.S. Water Prize for innovative water quality trading program – The Freshwater Trust, 2013
- Oregon Association of Clean Water Agencies, Special Recognition, Advancing Water Quality Trading – The
  Freshwater Trust, 2012
- ACEC Oregon Engineering Excellence Awards for the Ashland Comprehensive Sanitary Sewer Master Plan – The
  Freshwater Trust, 2012
Eugene Wier
Restoration Project Manager
eugene@thefreshwatertrust.org

Eugene Wier is the Restoration Project Manager for Southwest Oregon, where he provides innovative solutions for riparian restoration. His background in fish and wildlife biology and ecology set the stage for a deep understanding of the value and function of riparian habitats. With more than 10 years of experience in hands-on field science and restoration work, in Oregon and abroad, Eugene has developed an intimate knowledge of the resources, management concerns and methods that can be utilized to achieve restored river function.

Eugene has lived in the Rogue Valley since 1997 and has actively participated in many conservation initiatives and community efforts, locally and regionally. He has been involved in TMDL water quality monitoring on Bear Creek, macroinvertebrate studies, spawning surveys, smolt trapping and more. Eugene’s work connects him to land use managers and the restoration community in Bear Creek and the greater Rogue watershed. Prior to The Freshwater Trust, Eugene worked at Rogue Valley Council of Governments, where he was involved in natural resource planning, water quality monitoring, riparian restoration and consulting services to municipalities throughout the Rogue basin.

Experience
The Freshwater Trust, Portland, OR
Restoration Project Manager, 2012-present
- Implemented restoration projects as a component of Oregon’s first water quality trading program
- Develops The Trust’s approach to riparian restoration and translates water quality trading framework into implementable projects
- Leads The Trust’s outreach effort to landowners and development of materials used in communication with landowners and stakeholders
- Represents The Trust in the local community and develops and strengthens partnerships and relationships with local groups and initiatives

Rogue Valley Council of Governments, Central Point, OR
Natural Resource Technician 2008-2012
- Conducted water quality sampling and illicit discharge investigations in Bear Creek watershed
- Managed projects for riparian restoration, land use and conservation planning
- Provided education, outreach and presentations related to riparian ecology and other projects

Bureau of Land Management Medford District Office, Medford, OR
Field Technician in Hydrology and Wildlife Programs, 2006-2008
- Conducted hydrologic surveys and mapping of surface hydrology for Ashland resource area
- Conducted surveys for owls, red tree voles, pacific fisher, rare insects and more in support of district timber programs and conservation efforts

U.S. Department of the Interior, Aquatic and Riparian Effectiveness Monitoring Program, Corvallis, Oregon
Field Crew Leader, 2005
- Trained and led a field crew, sampling a variety of parameters on streams in the Northwest Forest Plan’s late-successional reserves
- Successfully managed field data and trained staff on rigorous sampling protocols

Education
B.S, Environmental Studies, Southern Oregon University, 2003
A.S, Environmental Studies, Columbia College, 1997
Memberships

- Board member of Bear Creek Watershed Council
- Organizing committee member of Jefferson Fish Society
- Member of The Society for Northwestern Vertebrate Biology
City of Ashland

Scope of Work

Outfall Relocation Study

Project Understanding

The current National Pollution Discharge Elimination System (NPDES) permit for the Ashland WWTP expired in 2008 (currently administratively extended) and the Oregon Department of Environmental Quality (DEQ) is planning to initiate the NPDES permit renewal process in October 2014. The renewed NPDES permit will include new requirements for effluent temperature and copper limits at the point of discharge and will consider revised mixing zone dilution associated with a relocated outfall. Compliance with the new limits is expected to be required within five years of permit issuance.

The new requirements create several challenges for the existing Ashland WWTP outfall to Ashland Creek, which has limited dilution during low flow periods. Consequently, the City of Ashland has decided to relocate the outfall from Ashland Creek to the higher-flow Bear Creek to improve dilutions and eliminate the current temperature impacts to Ashland Creek, while reducing the level of effluent cooling required to address migration blockage, thermal shock, and spawning impairments. A Bear Creek outfall location will provide greater dilution and a better mixing zone environment to meet restrictions on copper and other effluent constituents. The City of Ashland has discussed the concept of relocating the wastewater outfall to Bear Creek with DEQ and has received their initial support in permitting this project.

Even with the outfall relocation to Bear Creek, effluent cooling (by up 1.5 to 2 degrees Celsius in September) will be required to avoid a migration blockage condition for salmonids. In addition, during low flow portions of the spawning period (October 15 through May 15), effluent cooling may be necessary to meet spawning temperature restrictions at the new outfall site. As part of the Comprehensive Sanitary Sewer Master Plan (April 2012) and the current Wastewater Facility Plan effort, the use of wetlands and/or ponds was identified as the selected alternative for achieving the necessary near-field temperature reductions. However, the location, sizing, and operations of these wetlands and/or ponds is still undefined.

In order to support the City of Ashland and DEQ’s permit renewal process, the following efforts need to be completed prior to October 2014:

- Conceptual design of the new outfall to determine the outfall location, conveyance route, and discharge configuration;
- Outfall mixing zone dilution study for the relocated outfall to provide DEQ with the dilution factors and outfall mixing zone characteristics necessary to determine permit limits;
• Conceptual design of constructed wetlands or ponds capable of meeting near-field temperature limits for the new outfall; and

• Identification of permits and approvals necessary to implement the outfall relocation and constructed wetland developments.

Project Description

The City of Ashland plans to proceed with the Outfall Relocation Project in a phased approach to first solidify the conceptual design of the facilities and support the NPDES permit renewal and secondly to proceed with the preliminary and final designs and implementator of the facilities. This project is anticipated to be conducted in the following three phases:

• Phase 1a – Conceptual Design and Mixing Zone Dilution Study
• Phase 1b – Preliminary Design and Permitting
• Phase 2 – Final Design
• Phase 3 - Construction Administration

Under this scope of work, CH2M HILL will complete Phase 1a. At the completion of Phase 1a, the design will be approximately 15% complete; the alternatives analysis will be complete and major process elements, equipment and structure sizes, and major conveyance corridors will be known; the outfall mixing zone dilution study will be completed for the new outfall; and permits and approvals necessary to implement the outfall relocation and constructed wetland developments will be identified.

Detailed site investigations to support facility design such as geotechnical field investigations, hydrogeologic characterization, site survey, and wetland delineation will be conducted during Phase 1b. This approach will ensure that costs for those activities are not incurred until a facilities concept has been endorsed by the necessary City and agency stakeholders, and it is determined that the DEQ and other agencies will support the project in permitting.

For each major component of the project, CH2M HILL will prepare a project schedule and opinion of project costs based on the 15% design. CH2M HILL will also identify key design components that are critical or time sensitive to avoid delay or changes later in design. CH2M HILL will submit the conceptual design to DEQ for review and feedback, and will invite DEQ to participate in the design review meetings.

Assumptions

• Except where noted, electronic and up to five (5) hard copies of final submittals will be provided
• Drawings will be prepared in AutoCAD and will be presented as half-size (11”x17”) sheets
• Outfall relocation to Bear Creek will be acceptable to the City, DEQ, and natural resource agency stakeholders.
• In providing opinions of cost, CH2M HILL has no control over cost or prices set by 3rd parties and/or the market and therefore cannot guarantee that actual costs will not vary from our estimates.

• CH2M HILL will reasonably rely upon the accuracy, timeliness, and completeness of the information provided by City to CH2M HILL.

City-Provided Information

• Construction record drawings in AutoCAD format for affected facilities
• Specifications and operations and maintenance data for existing facilities to be affected by planned improvements
• Location of known utilities and utility easements in project areas
• Geotechnical investigation reports from past WWTP designs
• Digital elevation model with 2-foot contours covering project area
• WWTP effluent flow, temperature, dissolved oxygen, and chemistry (metals and ammonia) data records necessary to support the outfall mixing zone dilution study and to set design criteria for facility sizing
• Water quality sample results for effluent (10-12 minimum) and background Bear Creek (3-4 minimum) water quality collected to provide a minimum chemical analyses of total and dissolved metals, hardness and ammonia. City will collect and submit additional samples needed through a laboratory mutually selected by the City and CH2M HILL.

Scope of Work

The scope of work has been organized into seven tasks:

• Task 1 - Project Definition and Alternatives Analysis
• Task 2 - Natural Resources and NPDES Permitting
• Task 3 - Conceptual Design and Mixing Zone Study
• Task 4 - Public Outreach and Communications
• Task 5 - Project Management and Quality Control

Task 1. Project Definition and Alternatives Analysis

Task 1.1. Project Initiation

The purpose of this task is to confirm project goals and success factors, communication protocols, and key project stakeholders. Additionally, we will discuss priority issues that have been raised to date by permitting agencies, the parks commission, stakeholders, and the public, and will discuss design flows to be used for the analysis and other data to be provided by the City. This task will include one client kick-off meeting with City staff and one internal Consultant team kick-off meeting to charter the Consultant project team.

Assumptions

• The Client kick-off meeting will be held by conference call. The CH2M HILL project manager and key Consultant project team members will participate by phone.

Deliverables
- Client kick-off meeting minutes.

Task 1.2. Preliminary Flow, Temperature, and Dilution Analysis

This task will include a preliminary flow, temperature and dilution analysis to support the alternatives analysis and project definition. Available flow and temperature data from Bear and Ashland Creeks and Ashland WWTP will be analyzed. Heat Source Wetlands (HSW) models of Glendower Pond (open water pond) and densely vegetated constructed wetlands will be developed using Ashland climatic data. Temperature results will be used to guide initial sizing of pond/wetland areas needed to meet temperature standards. The DEQ analysis of dilutions to avoid migration blockage and spawning impairment will be updated.

Deliverables

- Draft technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 1.3. Project Alternatives Definition

After the field visit identified in Task 3.1 and draft completion of Task 1.2, up to four alternatives for wetland and pond development and outfall relocation and conveyance routing will be identified considering potential construction and permitting issues. Wetland and pond options that cannot meet the water quality criteria will not be considered further. For each option that can meet the water quality criteria, technical and permitting requirements and construction and maintenance issues will be outlined to assist in the evaluation of project alternatives. This information will be developed to provide the basis for discussion in the first public meeting.

Deliverables

- Draft technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 2. Natural Resources and NPDES Permitting

Task 2.1. Preliminary Environmental and Permitting Analysis

Using the selected alternative from Task 1.3, a preliminary environmental permitting analysis will be conducted to identify potential environmental constraints and approvals/permits needed from local, state, and federal agencies (DEQ, Jackson County, USACE, USFWS, NMFS, DSL, SHPO) during Phase 2. Available information will be utilized; required approvals, permits, and Phase 2 studies will be clearly summarized; and a permitting strategy will identify opportunities for impact avoidance and potential mitigation and expected permitting timelines.

Assumptions

- The Consultant project permitting lead will conduct a one-half day site visit as part of Task 3.1 to identify potential resource concerns. No additional field work will be conducted in this project phase.

Deliverables
• Draft technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 2.2. Agency Pre-Application Meeting

Following the completion of Task 1 and 3.1 and draft completion of Task 2.1, 3.2, and 3.3, the Consultant will hold a pre-application meeting with key agency staff to solicit input on the planned project elements. Anticipated participants include DEQ, USACE, DSL, ODFW, and NMFS. Results of this meeting will inform the completion of Task 2.1 and the identification of the outfall location, conveyance routes, and wetland locations to be incorporated in Task 3 and identify constraints to construction.

Assumptions

• One meeting with agencies will be held in Ashland

• The CH2M HILL project manager, permitting lead, and one subconsultant staff will be present at the agency meeting (other project team members may attend by phone)

Deliverables

• Meeting minutes

Task 3. Conceptual Design and Mixing Zone Study

Task 3.1. Field Studies

This task includes two site visits to support the site selection and conceptual design of the outfall pipeline, diffuser, and constructed wetlands and the outfall mixing zone dilution study. The first visit will be a site reconnaissance to determine outfall location, conveyance routing, and wetland options considering constructability, resource issues, operations and maintenance issues, and technical feasibility. This information will be used in developing the project alternatives under Task 1.3 to assist in agency and stakeholder support of a selected alternative. After selection of the proposed outfall location from the identified alternatives, the second visit will collect detailed riverbed bathymetry/velocity profiles at the proposed new outfall location to support the outfall mixing zone dilution study.

Assumptions

• Up to four technical staff covering constructability, permitting, outfall design, and wetland design will be present to conduct the first site visit (one-half day on site)

• The outfall mixing zone dilution study lead and one support staff will be present to conduct data collection with the second site visit

Deliverables

• Draft field visit summary technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 3.2. Outfall and Diffuser Conceptual Design and Mixing Zone Dilution Study

This task will develop up to two outfall relocation concepts and dilution modeling of the concepts for existing, selected planning horizon, and buildout flows at the one selected outfall location. Hydraulic modeling evaluations will be conducted to define future capacity
needs so that outfall diffusers can be designed to accommodate full buildout. A meeting will be held with the City at the completion of the draft study to review findings and recommendations to facilitate selection of a preferred alternative. The preferred alternative will be described in the mixing zone dilution report prepared to comply with the guidance in the DEQ’s Mixing Zone Internal Management Directive.

**Deliverables**

- Draft outfall dilution mixing zone dilution study. Final content will be incorporated into the conceptual engineering design report.

**Task 3.3. Wetland Conceptual Design**

This task will develop a conceptual design of constructed wetlands necessary to meet the near field temperature criteria. Major conveyance needs, routes, and sizing will be developed and hydraulic profiles will be prepared. HSW models developed under Task 1.2 will be updated with final wetland footprints and flow routing to simulate the effluent cooling. This information will be used to support the completion of the outfall mixing zone dilution study under Task 3.2 and to quantify total excess thermal load benefits (annually, by month) to complement other efforts by the City to address far field temperature impacts and thermal mitigation requirements.

**Deliverables**

- Wetland conceptual design incorporated into the conceptual engineering design report.

**Task 3.4. Conceptual Engineering Drawings**

The following eight (8) sheets of conceptual engineering design drawings are anticipated:

- Title, index, vicinity map (1 sheet)
- Overall site plan (1 sheet)
- Hydraulic profile (1 sheet)
- WWTP yard piping and pump station plan (1 sheet)
- Outfall pipeline plan and section (1 sheet)
- River outfall plan and section (1 sheet)
- Constructed wetlands plan and cross sections (2 sheets)

**Deliverables**

- Drawings included within the conceptual engineering design report

**Task 3.5. Cost Estimate**

A Class 4 (+30%/-20%) cost estimate will be prepared for all major conceptual design components at the completion of the conceptual design. The cost estimate will be included within the conceptual engineering design report.

**Deliverables**

- A class 4 cost estimate included within the conceptual engineering design report
This task will document the results of the subtasks described above in a conceptual engineering design report suitable for submission to DEQ. Most of the sections of the report will be written as part of the corresponding subtasks, as indicated in the deliverables listed under each subtask. Report sections that will be written as part of this subtask include the executive summary, introduction, design criteria and flow projections, and project implementation plan. Other sections of the report will generally correspond to the subtasks.

Deliverables

- Draft and final Conceptual Engineering Design Report

Task 4. Public Outreach and Communications

Task 4.1. Public Outreach and Communications Strategy
This task will develop a public outreach and communications strategy, in concert with the City, to create an effective communication process that is transparent and inclusive. A draft communications strategy will be prepared and distributed to the City, a conference call will be held with City staff, and a final communications strategy will be documented to incorporate City comments.

Deliverables

- Draft and final public communications strategy memoranda

Task 4.2. Community Consultation
This task will include Consultant facilitation of two planned public meetings and presentation during one City Council meeting plus a contingency for two additional meetings if needed. Supporting graphic poster boards, handouts, and other materials will be prepared to facilitate information exchange. Key CH2M HILL and subconsultant team members will present project proposals for discussion and will document public comments.

Assumptions

- Two meetings will be held with Ashland Parks Commission, business/property owners, and other agency stakeholders identified in the public communications strategy
- Presentation at one City Council meeting
- Contingency has been provided to support up to two additional meetings if needed
- The CH2M HILL project manager and one subconsultant staff will be present at the public meetings and City Council meeting

Deliverables

- Graphic poster boards, handouts, and other materials to support public meetings
- Meeting minutes from public meetings
Task 5. Project Management and Quality Control

Task 5.1. Project Management

This task includes Consultant activities needed to initiate, plan, manage, and close the project. Throughout the project, the consultant project manager will maintain frequent and open communication with the City's project manager and will work closely with the City's project manager to anticipate changes in project needs.

Assumptions

- The level of effort assumes up to six (6) coordination meetings by phone with City staff and monthly invoices and status reports for six (6) months (May through October 2014)

Deliverables

- Project instructions, monthly invoices and project status reports

Task 5.2. Quality Assurance/Quality Control

This task includes the development of the Quality Management Plan (QMP) and reviewer time to review deliverables. This QMP will define the “work plan” for quality assurance/quality control (QA/QC), specifying who needs to review which deliverables, what their budget is for this review, and when the reviews need to be conducted. The QMP for this project will be succinct and will clearly define the roles and responsibilities of the technical reviewers.

Deliverables

- Project Quality Management Plan

Schedule

A proposed project schedule is attached to this scope of work. The costs associated with this scope of work assume that the project duration will be no more than 6 months.
### City of Ashland

#### Outfall Relocation Study

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**Notes:**
- The table above represents a summary of the project tasks and their respective hours and labor. The total hours and labor are calculated across all tasks, including the total for the project.
City of Ashland

Scope of Work

Outfall Relocation Study

Project Understanding

The current National Pollution Discharge Elimination System (NPDES) permit for the Ashland WWTP expired in 2008 (currently administratively extended) and the Oregon Department of Environmental Quality (DEQ) is planning to initiate the NPDES permit renewal process in October 2014. The renewed NPDES permit will include new requirements for effluent temperature and copper limits at the point of discharge and will consider revised mixing zone dilution associated with a relocated outfall. Compliance with the new limits is expected to be required within five years of permit issuance.

The new requirements create several challenges for the existing Ashland WWTP outfall to Ashland Creek, which has limited dilution during low flow periods. Consequently, the City of Ashland has decided to relocate the outfall from Ashland Creek to the higher-flow Bear Creek to improve dilutions and eliminate the current temperature impacts to Ashland Creek, while reducing the level of effluent cooling required to address migration blockage, thermal shock, and spawning impairments. A Bear Creek outfall location will provide greater dilution and a better mixing zone environment to meet restrictions on copper and other effluent constituents. The City of Ashland has discussed the concept of relocating the wastewater outfall to Bear Creek with DEQ and has received their initial support in permitting this project.

Even with the outfall relocation to Bear Creek, effluent cooling (by up 1.5 to 2 degrees Celsius in September) will be required to avoid a migration blockage condition for salmonids. In addition, during low flow portions of the spawning period (October 15 through May 15), effluent cooling may be necessary to meet spawning temperature restrictions at the new outfall site. As part of the Comprehensive Sanitary Sewer Master Plan (April 2012) and the current Wastewater Facility Plan effort, the use of wetlands and/or ponds was identified as the selected alternative for achieving the necessary near-field temperature reductions. However, the location, sizing, and operations of these wetlands and/or ponds is still undefined.

In order to support the City of Ashland and DEQ’s permit renewal process, the following efforts need to be completed prior to October 2014:

- Conceptual design of the new outfall to determine the outfall location, conveyance route, and discharge configuration;
- Outfall mixing zone dilution study for the relocated outfall to provide DEQ with the dilution factors and outfall mixing zone characteristics necessary to determine permit limits;
• Conceptual design of constructed wetlands or ponds capable of meeting near-field temperature limits for the new outfall; and

• Identification of permits and approvals necessary to implement the outfall relocation and constructed wetland developments.

Project Description

The City of Ashland plans to proceed with the Outfall Relocation Project in a phased approach to first solidify the conceptual design of the facilities and support the NPDES permit renewal and secondly to proceed with the preliminary and final designs and implementator of the facilities. This project is anticipated to be conducted in the following three phases:

• Phase 1a – Conceptual Design and Mixing Zone Dilution Study

• Phase 1b – Preliminary Design and Permitting

• Phase 2 – Final Design

• Phase 3 - Construction Administration

Under this scope of work, CH2M HILL will complete Phase 1a. At the completion of Phase 1a, the design will be approximately 15% complete; the alternatives analysis will be complete and major process elements, equipment and structure sizes, and major conveyance corridors will be known; the outfall mixing zone dilution study will be completed for the new outfall; and permits and approvals necessary to implement the outfall relocation and constructed wetland developments will be identified.

Detailed site investigations to support facility design such as geotechnical field investigations, hydrogeologic characterization, site survey, and wetland delineation will be conducted during Phase 1b. This approach will ensure that costs for those activities are not incurred until a facilities concept has been endorsed by the necessary City and agency stakeholders, and it is determined that the DEQ and other agencies will support the project in permitting.

For each major component of the project, CH2M HILL will prepare a project schedule and opinion of project costs based on the 15% design. CH2M HILL will also identify key design components that are critical or time sensitive to avoid delay or changes later in design. CH2M HILL will submit the conceptual design to DEQ for review and feedback, and will invite DEQ to participate in the design review meetings.

Assumptions

• Except where noted, electronic and up to five (5) hard copies of final submittals will be provided

• Drawings will be prepared in AutoCAD and will be presented as half-size (11”x17”) sheets

• Outfall relocation to Bear Creek will be acceptable to the City, DEQ, and natural resource agency stakeholders.
• In providing opinions of cost, CH2M HILL has no control over cost or prices set by 3rd parties and/or the market and therefore cannot guarantee that actual costs will not vary from our estimates.
• CH2M HILL will reasonably rely upon the accuracy, timeliness, and completeness of the information provided by City to CH2M HILL.

City-Provided Information

• Construction record drawings in AutoCAD format for affected facilities
• Specifications and operations and maintenance data for existing facilities to be affected by planned improvements
• Location of known utilities and utility easements in project areas
• Geotechnical investigation reports from past WWTP designs
• Digital elevation model with 2-foot contours covering project area
• WWTP effluent flow, temperature, dissolved oxygen, and chemistry (metals and ammonia) data records necessary to support the outfall mixing zone dilution study and to set design criteria for facility sizing
• Water quality sample results for effluent (10-12 minimum) and background Bear Creek (3-4 minimum) water quality collected to provide a minimum chemical analyses of total and dissolved metals, hardness and ammonia. City will collect and submit additional samples needed through a laboratory mutually selected by the City and CH2M HILL.

Scope of Work

The scope of work has been organized into seven tasks:

• Task 1 - Project Definition and Alternatives Analysis
• Task 2 - Natural Resources and NPDES Permitting
• Task 3 - Conceptual Design and Mixing Zone Study
• Task 4 - Public Outreach and Communications
• Task 5 - Project Management and Quality Control

Task 1. Project Definition and Alternatives Analysis

Task 1.1. Project Initiation

The purpose of this task is to confirm project goals and success factors, communication protocols, and key project stakeholders. Additionally, we will discuss priority issues that have been raised to date by permitting agencies, the parks commission, stakeholders, and the public, and will discuss design flows to be used for the analysis and other data to be provided by the City. This task will include one client kick-off meeting with City staff and one internal Consultant team kick-off meeting to charter the Consultant project team.

Assumptions

• The Client kick-off meeting will be held by conference call. The CH2M HILL project manager and key Consultant project team members will participate by phone.

Deliverables
• Client kick-off meeting minutes.

Task 1.2. Preliminary Flow, Temperature, and Dilution Analysis
This task will include a preliminary flow, temperature and dilution analysis to support the alternatives analysis and project definition. Available flow and temperature data from Bear and Ashland Creeks and Ashland WWTP will be analyzed. Heat Source Wetlands (HSW) models of Glendower Pond (open water pond) and densely vegetated constructed wetlands will be developed using Ashland climatic data. Temperature results will be used to guide initial sizing of pond/wetland areas needed to meet temperature standards. The DEQ analysis of dilutions to avoid migration blockage and spawning impairment will be updated.

Deliverables
• Draft technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 1.3. Project Alternatives Definition
After the field visit identified in Task 3.1 and draft completion of Task 1.2, up to four alternatives for wetland and pond development and outfall relocation and conveyance routing will be identified considering potential construction and permitting issues. Wetland and pond options that cannot meet the water quality criteria will not be considered further. For each option that can meet the water quality criteria, technical and permitting requirements and construction and maintenance issues will be outlined to assist in the evaluation of project alternatives. This information will be developed to provide the basis for discussion in the first public meeting.

Deliverables
• Draft technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 2. Natural Resources and NPDES Permitting
Task 2.1. Preliminary Environmental and Permitting Analysis
Using the selected alternative from Task 1.3, a preliminary environmental permitting analysis will be conducted to identify potential environmental constraints and approvals/permits needed from local, state, and federal agencies (DEQ, Jackson County, USACE, USFWS, NMFS, DSL, SHPO) during Phase 2. Available information will be utilized; required approvals, permits, and Phase 2 studies will be clearly summarized; and a permitting strategy will identify opportunities for impact avoidance and potential mitigation and expected permitting timelines.

Assumptions
• The Consultant project permitting lead will conduct a one-half day site visit as part of Task 3.1 to identify potential resource concerns. No additional field work will be conducted in this project phase.

Deliverables
• Draft technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 2.2. Agency Pre-Application Meeting
Following the completion of Task 1 and 3.1 and draft completion of Task 2.1, 3.2, and 3.3, the Consultant will hold a pre-application meeting with key agency staff to solicit input on the planned project elements. Anticipated participants include DEQ, USACE, DSL, ODFW, and NMFS. Results of this meeting will inform the completion of Task 2.1 and the identification of the outfall location, conveyance routes, and wetland locations to be incorporated in Task 3 and identify constraints to construction.

Assumptions
• One meeting with agencies will be held in Ashland
• The CH2M HILL project manager, permitting lead, and one subconsultant staff will be present at the agency meeting (other project team members may attend by phone)

Deliverables
• Meeting minutes

Task 3. Conceptual Design and Mixing Zone Study
Task 3.1. Field Studies
This task includes two site visits to support the site selection and conceptual design of the outfall pipeline, diffuser, and constructed wetlands and the outfall mixing zone dilution study. The first visit will be a site reconnaissance to determine outfall location, conveyance routing, and wetland options considering constructability, resource issues, operations and maintenance issues, and technical feasibility. This information will be used in developing the project alternatives under Task 1.3 to assist in agency and stakeholder support of a selected alternative. After selection of the proposed outfall location from the identified alternatives, the second visit will collect detailed riverbed bathymetry/velocity profiles at the proposed new outfall location to support the outfall mixing zone dilution study.

Assumptions
• Up to four technical staff covering constructability, permitting, outfall design, and wetland design will be present to conduct the first site visit (one-half day on site)
• The outfall mixing zone dilution study lead and one support staff will be present to conduct data collection with the second site visit

Deliverables
• Draft field visit summary technical memorandum. Final content will be incorporated into the conceptual engineering design report.

Task 3.2. Outfall and Diffuser Conceptual Design and Mixing Zone Dilution Study
This task will develop up to two outfall relocation concepts and dilution modeling of the concepts for existing, selected planning horizon, and buildout flows at the one selected outfall location. Hydraulic modeling evaluations will be conducted to define future capacity
needs so that outfall diffusers can be designed to accommodate full buildout. A meeting will be held with the City at the completion of the draft study to review findings and recommendations to facilitate selection of a preferred alternative. The preferred alternative will be described in the mixing zone dilution report prepared to comply with the guidance in the DEQ’s Mixing Zone Internal Management Directive.

Deliverables

- Draft outfall dilution mixing zone dilution study. Final content will be incorporated into the conceptual engineering design report.

Task 3.3. **Wetland Conceptual Design**

This task will develop a conceptual design of constructed wetlands necessary to meet the near field temperature criteria. Major conveyance needs, routes, and sizing will be developed and hydraulic profiles will be prepared. H5W models developed under Task 1.2 will be updated with final wetland footprints and flow routing to simulate the effluent cooling. This information will be used to support the completion of the outfall mixing zone dilution study under Task 3.2 and to quantify total excess thermal load benefits (annually, by month) to complement other efforts by the City to address far field temperature impacts and thermal mitigation requirements.

Deliverables

- Wetland conceptual design incorporated into the conceptual engineering design report

Task 3.4. **Conceptual Engineering Drawings**

The following eight (8) sheets of conceptual engineering design drawings are anticipated:

- Title, index, vicinity map (1 sheet)
- Overall site plan (1 sheet)
- Hydraulic profile (1 sheet)
- WWTP yard piping and pump station plan (1 sheet)
- Outfall pipeline plan and section (1 sheet)
- River outfall plan and section (1 sheet)
- Constructed wetlands plan and cross sections (2 sheets)

Deliverables

- Drawings included within the conceptual engineering design report

Task 3.5. **Cost Estimate**

A Class 4 (+30%/-20%) cost estimate will be prepared for all major conceptual design components at the completion of the conceptual design. The cost estimate will be included within the conceptual engineering design report.

Deliverables

- A class 4 cost estimate included within the conceptual engineering design report

This task will document the results of the subtasks described above in a conceptual engineering design report suitable for submission to DEQ. Most of the sections of the report will be written as part of the corresponding subtasks, as indicated in the deliverables listed under each subtask. Report sections that will be written as part of this subtask include the executive summary, introduction, design criteria and flow projections, and project implementation plan. Other sections of the report will generally correspond to the subtasks.

Deliverables

- Draft and final Conceptual Engineering Design Report

Task 4. Public Outreach and Communications

Task 4.1. Public Outreach and Communications Strategy

This task will develop a public outreach and communications strategy, in concert with the City, to create an effective communication process that is transparent and inclusive. A draft communications strategy will be prepared and distributed to the City, a conference call will be held with City staff, and a final communications strategy will be documented to incorporate City comments.

Deliverables

- Draft and final public communications strategy memoranda

Task 4.2. Community Consultation

This task will include Consultant facilitation of two planned public meetings and presentation during one City Council meeting plus a contingency for two additional meetings if needed. Supporting graphic poster boards, handouts, and other materials will be prepared to facilitate information exchange. Key CH2M HILL and subconsultant team members will present project proposals for discussion and will document public comments.

Assumptions

- Two meetings will be held with Ashland Parks Commission, business/property owners, and other agency stakeholders identified in the public communications strategy
- Presentation at one City Council meeting
- Contingency has been provided to support up to two additional meetings if needed
- The CH2M HILL project manager and one subconsultant staff will be present at the public meetings and City Council meeting

Deliverables

- Graphic poster boards, handouts, and other materials to support public meetings
- Meeting minutes from public meetings
Task 5. Project Management and Quality Control

Task 5.1. Project Management

This task includes Consultant activities needed to initiate, plan, manage, and close the project. Throughout the project, the consultant project manager will maintain frequent and open communication with the City's project manager and will work closely with the City's project manager to anticipate changes in project needs.

Assumptions

- The level of effort assumes up to six (6) coordination meetings by phone with City staff and monthly invoices and status reports for six (6) months (May through October 2014)

Deliverables

- Project instructions, monthly invoices and project status reports

Task 5.2. Quality Assurance/Quality Control

This task includes the development of the Quality Management Plan (QMP) and reviewer time to review deliverables. This QMP will define the "work plan" for quality assurance/quality control (QA/QC), specifying who needs to review which deliverables, what their budget is for this review, and when the reviews need to be conducted. The QMP for this project will be succinct and will clearly define the roles and responsibilities of the technical reviewers.

Deliverables

- Project Quality Management Plan

Schedule

A proposed project schedule is attached to this scope of work. The costs associated with this scope of work assume that the project duration will be no more than 6 months.
### Outfall Relocation Study

#### Summary Table

| Task | Task Name | Location | Season | Volume | Quantity | Class | L&M | Site | PERP | PERD | PRA | PDP | MDP | MIP | Job | HR | Admin | Facility | COTA | DOD | EOD | PRT | Field | Field | Field | Field | Field | Field | Field | Field |
|------|-----------|----------|--------|--------|---------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

#### Cost Analysis

| Task | Task Name | Location | Season | Volume | Quantity | Class | L&M | Site | PERP | PERD | PRA | PDP | MDP | MIP | Job | HR | Admin | Facility | COTA | DOD | EOD | PRT | Field | Field | Field | Field | Field | Field | Field | Field |
|------|-----------|----------|--------|--------|---------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|      |           |          |        |        |         |       |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

#### Additional Data

- **Total Cost:** $46,907
- **Estimated:** $34,644
- **Estimated Savings:** $7,153
- **Estimated Additional Cost:** $6,524
- **Total Estimated Cost:** $46,907
- **Estimated Savings:** $34,644
- **Estimated Additional Cost:** $6,524
- **Total Estimated Cost:** $46,907

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**Note:** The table above provides a detailed breakdown of costs associated with the Outfall Relocation Study, including various tasks, locations, and estimated figures. Each task is categorized under different headings such as Location, Season, Volume, and Quantity, among others, to provide a comprehensive view of the study's requirements and costs.