# SMALL TRIBE, RURAL COMMUNITY, BIG WASTEWATER DREAMS

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IACC Annual Conference

## WHERE DID WE START?


### Approved Facility Plans

- Hoodsport RAC
- Potlatch Bubble
- Core Reservation Area

### EPA Programmatic Agreement

- Draft Environmental Assessment
- Preliminary FONSI

### $7.9M in Grant Funding

- 2003/2006/2008 EPA STAG Appropriations = $6.4M
- $0.5M State Toxics Account
- $1.0M Centennial Clean Water Program

**WE WERE BROKE!**

## FOCUS ON GAINING MOMENTUM


### Tri-Party Memorandum of Understanding

- Joint Technical Advisory Committee
- Fiscal Agent
- Ownership and Operation

### Prioritize Projects

- Potlatch Bubble – $5.9M
- Hoodsport – $9.0M
- Core Reservation Area – $9.6M

### Resolution of Agency Interests

### Hire a Final Design Consultant

### Execute Grant/Funding Agreements

- Legislative Approach
- Long-Term Funding Strategy

## READY! SET! GO… PAUSE!!

- APRIL/MAY 2009
  **Solicitation/Interview Final Design Firms**
- JUNE 2009
  **Gray & Osborne Selected as Final Design Firm**
- JULY/AUGUST 2009
  **Scope & Contract Negotiations**
- SEPTEMBER 2009
  **Revised Approach–Potlatch Design Only**
- FEBRUARY-APRIL 2010
  **Grant / Funding Agreement Coordination**
  - WA State Parks | February 2010
  - DOE | February 2010
  - Construction Funding | March 2010
  - EPA | April 2010

## DESIGN TAKEAWAYS

The delta estuary shoreline portion of the Force Main Sewer Extension Project Area. The new force main will be built along the near side of the highway. View is to the south.

### MBR Supplier Pre-Procurement

### Frequent Design Team Meetings

- Resolution of Potential Conflicts
- Timely Decision Making

### Value Engineering Workshop

- Validation of Design Decision
- Impactful for Fine Tuning Capital Expenditures

### Risk Mitigation for Potential Cultural Resource Impacts during Construction

## THE ONLY CONSTANT IS CHANGE!

Potlatch Wastewater Reclamation Facility
Funding Breakdown for Construction of the Project
February 16, 2011

| Item | Description | Estimated Construction Cost* |
|---|---|---|
| 1. | MBR Wastewater Treatment Plant | $3,609,469 |
| 2. | MBR Equipment System | $530,100 |
| 3. | Effluent Disposal System | $440,703 |
| 4. | Improvements to Potlatch State Park Sewer Conveyance System | $790,423 |
| 5. | Highway 101 Service Area Conveyance System (includes area from Potlatch State Park to Waterfront Motel) | $993,526 |
| | Sub-Total Estimated Construction Cost | $6,364,221 |
| 6. | Construction Management, Administration, Engineering and Inspection | $960,000 |
| | Total Estimated Project Cost | $7,324,221 |

| Item | Funding Source | Estimated Available Funds |
|---|---|---|
| 1. | Ecology Legislative Proviso (Toxics Account) | $500,000 |
| 2. | Ecology Legislative Proviso | $1,645,000 |
| 3. | Washington State Parks and Recreation Commission - Potlatch State Park Improvements | $855,415 |
| 4. | USEPA STAG Grant (55% Match)* | $3,667,175 |
| | Total Estimated Project Funding | $6,667,590 |
| | Total Estimated Funding Difference | $656,631 |

*Construction estimate based on 60% design completion.

### Federal Budget Recisions in 2011 Impacted the Construction Funding

### Revised Construction Packages and Schedule

- WWTP – Bid Spring 2012
- Collection System – delayed by one year
- Additional DOE Loan/Grant Funding Package of $1.2M

### CM Retired just Prior to Start

### Mason County PUD#1 Formally Withdrew from the Tri-Party

### Mason County Opted to Informally Withdraw

## SUCCESSFUL PERSEVERANCE

**Timing of the Collection System Completion Synced with WWTP Startup**

**Team was Cohesive and Nimble – Managed 3 Simultaneous Projects for 8 Months**

**Successful Funding Strategy Allowed for No Hookup Fees**

**WWTP Change Orders = $22.4K or 0.5% of Total Construction**

**Total Potlatch Construction Cost was $475K Under Funding**

- Limited Loan Dollars Expended

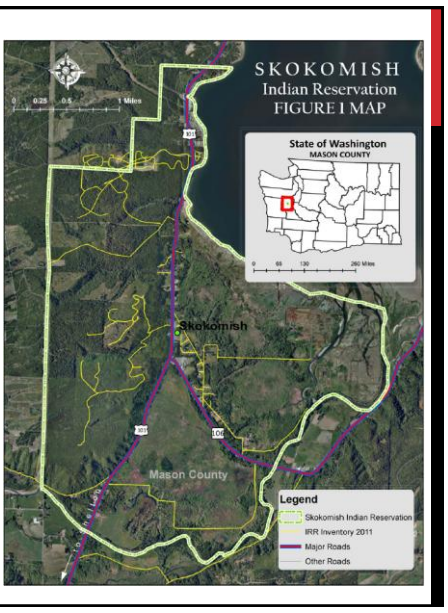
## SKOKOMISH INDIAN RESERVATION

**The Skokomish Reservation is 4,950 acres in the southeast corner of the Olympic Peninsula.**

**Skokomish River drains 240 square miles of mostly forested land.**

**Hood Canal is a natural, glacier-carved fjord more than 60 miles long.**

**724 tribal members**





## TRIBAL PRIORITY

### STRONG FISHERIES

- **85% of the Skokomish community relies on fishing either for their family's livelihood or for subsistence**
- **Herring**
- **Crab, shrimp, geoduck, clams, oysters**
- **Coho, Chinook, Chum, Cutthroat, Steelhead, King, Bulltrout,**
- **No Sockeye for 90 years**

## 12-YEAR HABITAT RESTORATION PLAN

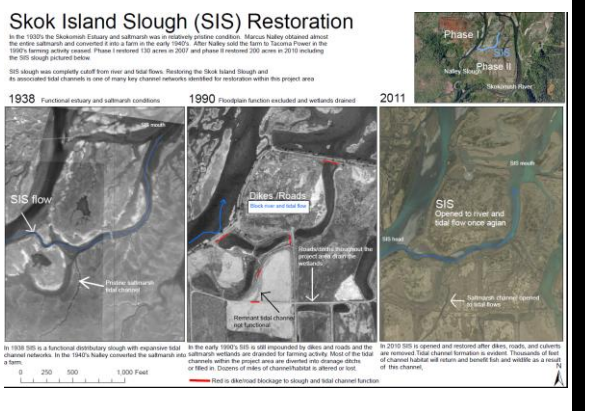
### SKOKOMISH ESTUARY RESTORATION

- **Estuary Restoration begins in 2007**
  - (Twelve year plan)
- **Dike and culvert removal**
- **Installation of LWD**
- **Over 1,000 acres restored**
- **2 new hatcheries under construction**


## HABITAT RESTORATION

### HABITAT LOSS

- **Cushman Dam built by Tacoma in 1930**
- **Nalley Farms diked and drained 200 acres – also in 1930's**
- **Small farms proliferate along Skokomish River**



# HOOD CANAL WATER QUALITY

**STUDY CONFIRMS SEPTIC TANKS CONTRIBUTE TO HOOD CANAL FISH KILLS**

**KITSAP SUN**

Christopher Dunagan

**9:43 PM, Apr 12, 2011**

SEATTLE - Septic systems in Southern Hood Canal appear to play a pivotal role in the massive fish kills that plague the waterway, according to a long-awaited report by a team of scientists.

The scientists' general findings about what causes oxygen to reach deadly levels in Hood Canal vary little from a description they provided in 2008. Since then, the group has conducted an extensive analysis, offering more precise estimates about the sources of nitrogen entering the waterway.

Their final conclusion is that roughly 20 percent of the nitrogen in Southern Hood Canal during summer months comes from septic systems. That is enough nitrogen to push oxygen levels into a critically low range and set up conditions for a massive fish kill in the fall.

"It is important to stress that the natural variation of oxygen from year to year is very high," said Jan Newton, who led the $4.5-million Hood Canal Dissolved Oxygen Program at the University of Washington.

Because Hood Canal is long and narrow, its slow flushing rate can lead to low oxygen levels even without human influence, Newton said. "But in a year when the natural oxygen level is relatively low, the added human drawdown can push it over a threshold where the fish can die."

**HOOD CANAL FISH KILLS UNDERSCORES URGENCY IN CLEANING UP PUGET SOUND**

**Puget Sound Partnership**

**FOR IMMEDIATE RELEASE**

Sept. 21, 2010

**HOODSPORT, Wash.** -- The latest fish kill on Hood Canal underscores the importance of a comprehensive, unified approach to restoring Puget Sound to health. The Puget Sound Action Agenda is the roadmap to that unified approach.

The fish kill is a result of low oxygen levels in Hood Canal, causing the fish to suffocate. The low oxygen in Hood Canal this year is primarily due to ocean processes but is made worse by human loading of nitrogen.

"The automated buoy monitoring system in Hood Canal is showing us how low the oxygen level is, and will help us to understand the processes involved that cause the increased nitrogen," said Jan Newton, Ph.D., principal oceanographer at the Applied Physics Lab, University of Washington.

One contributing factor to increased nitrogen is failing septic systems or improperly treated sewage entering the water.

# POTLATCH PLANT SERVICE AREA 2014


# TRIBE AS OWNER/OPERATOR

**OPERATIONS**

- Tribal and non-tribal hookups
- Sewer billing combined with Tribe's water billing system
- Contracted part-time operator
- Service area will be enlarged in 2015

**FEES**

Tribe's commitment to keep affordable fees

- No debt in fee scale
- At maximum hook up, Tribe will subsidize 25-30% of operations
- Incentives for keeping current with billing
- No fee increase for first 3 years

# POTLATCH PLANT SERVICE AREA 2015-16


# THE VIEW

**WWTPs often are screened with walls or plants to hide the facility from the public sensibility.**

**The original plans for Potlatch called for large trees and shrubs to surround the facility.**

**The reservation community is proud of the facility; proud to accomplish this work; proud to operate Potlatch Plant.**


# MBR ENVIRONMENTAL BENEFITS

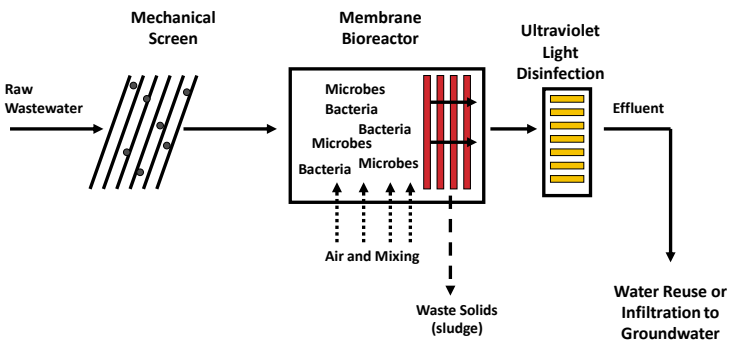
**Meets Water Reuse Requirements:**

- Provide reliable treatment of wastewater to meet strict water quality requirements for intended reuse application.
- Protect public health.

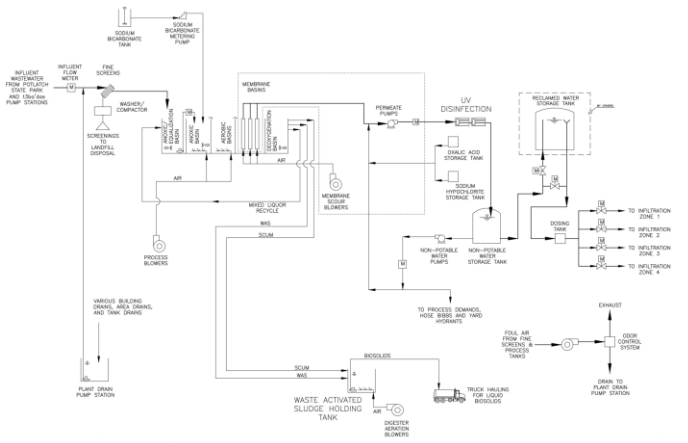
**Potential Water Reuse Applications:**

- Irrigation (lawns, gardens, parks, etc.).
- Non-potable uses (toilet flushing, fire protection, sewer flushing).
- Industrial activities (cooling, washdown, process water).

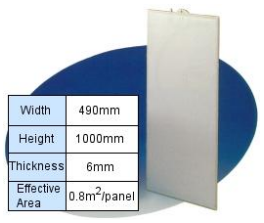
## SIMPLIFIED MBR PROCESS DIAGRAM



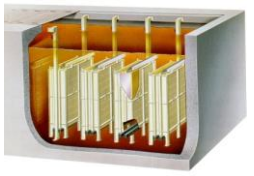

## POTLATCH WRF PROCESS DIAGRAM



## Flat Plate Membrane (Kubota)



| | |
|---|---|
| Width | 490mm |
| Height | 1000mm |
| Thickness | 6mm |
| Effective Area | 0.8m²/panel |

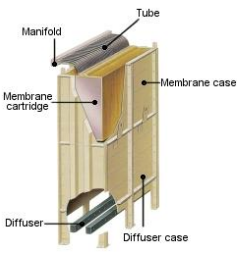


### Typical MBR Layout

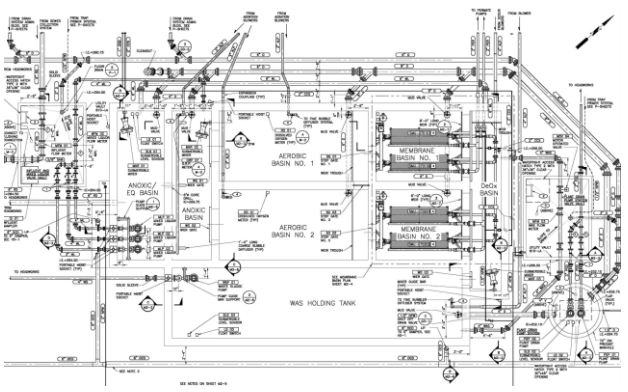
A MBR basin can be constructed of concrete or steel. To facilitate installation and maintenance, optional guide rails are available. MBR basis should be covered to avoid the introduction of fouling debris and mitigate the effects of ambient temperature on plant operation.

### Membrane Unit Components

Each MBR plant utilizes one or more membrane units. Easy to assemble and maintain, each membrane unit is comprised of a lower diffuser case and an upper membrane case. The diffuser case houses a coarse-bubble diffuser manifold that is designed to provide and properly distribute sufficient air for membrane cleaning. The membrane case, or cassette, contains slots that support each membrane cartridge. A permeate port at the top of each membrane cartridge is connected to a manifold via a transparent tube.




## POTLATCH WRF PROCESS TANKS



## POTLACH WRF

## POTLATCH WRF PROCESS TANKS

## MBR INSTALLATION


## MBR INSTALLATION


## EFFLUENT INFILTRATION DRAINFIELDS

## RECLAIMED WATER SYSTEM

## PARTNERS

**FUNDING PARTNERS**

- WA Department of Ecology
- Environmental Protection Agency
- Congressman Norm Dicks

**LEVERAGED RESOURCES**

- USDA – t3ba'das lift station & domestic water
- HUD – recycled water facility
- FHWA/PLHD – roadway
- WA State Parks (match/lift station)

**OTHERS**

Puget Sound Partnership
Mason County
Mason PUD #1
Hood Canal Communications