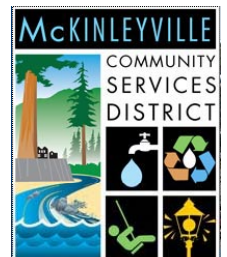


# McKinleyville Community Services District



## Wastewater Facilities Plan Administrative Draft - Public Presentation

Presented By:  
Lisa Stromme, P.E.  
November 7, 2011



**SN**

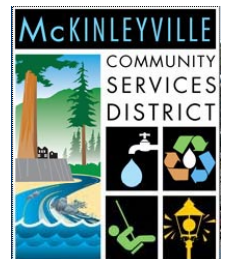
## Introduction

SHN presented the Administrative Draft of the Facilities Plan for the MCSD Wastewater Management Facility (WWMF) to the MCSD Board on October 19, 2011.

The Facilities Plan identifies a recommended alternative for upgrading the existing system to meet current regulatory requirements as well as address projected growth needs in the community.

Board approval of the recommended alternative is needed to move forward with system upgrades.

The public is encouraged to send comments on the plan to MCSD for consideration during the public review and comment period.



## Public Review and Comment Period

### Facilities Plan Review

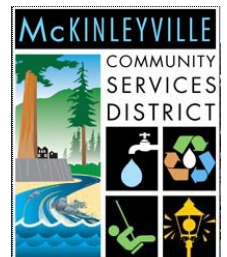
- The public is encouraged to review the Administrative Draft of the Facilities Plan.
- The document is available for review at the MCSD office and on the MCSD website:

<http://mckinleyvillecsd.com/document-library>

### Facilities Plan Comments

- Comment period started on October 19, 2011.
- Comment period ends at 5 pm on December 14, 2011.
- The public should address comments on the plan to Norman Shopay, the MCSD General Manager.

McKinleyville Community Services District  
P.O. Box 2037  
McKinleyville, CA 95519



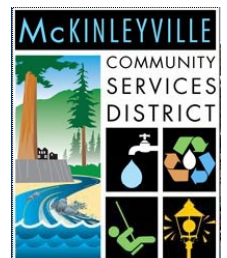
## Presentation Overview

**The goal of this presentation is to:**

- Provide an overview of the 20-Year Wastewater Facilities Plan developed for the MCSD WWMF.

**The objective of this presentation is to:**

- Outline the various elements of the 20-Year Wastewater Facilities Plan and present the recommendations for system upgrades.



**SN**

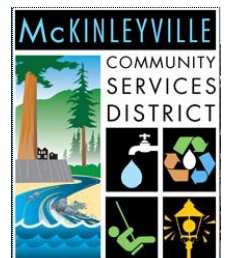
## Facilities Planning Process

### Brief History of the Facilities Planning Process:

- Project started in 2008, initiated by MCSD staff
- Conducted system assessments in 2009
- Completed feasibility study in 2010
- Developed the Facilities Plan in 2011

### Major Milestones Throughout the Process:

- Public Scoping Session – April 2010
- Technical Review Session – June 2010
- Selection of Alternatives – July 2010
- Completed Reclamation Study – February 2011
- Completed NPDES Permit Renewal – April 2011
- Peer Review Facilities Plan – August 2011



## Overview of the Public Scoping Session (April 2010)

The workshop presented an opportunity for the public to provide input on alternatives to be included in the Facilities Plan.

The outcome included a list of ideas and treatment system goals that the public would like MCSD to consider.

### Treatment system:

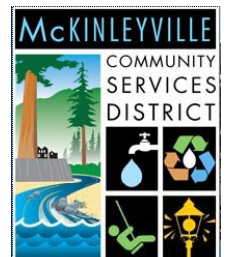
- Promote energy efficiency
- Increase passive/wetland system use
- Provide recreational benefits
- Incremental build-out of upgrades
- Reduce influent flow/gray water

### Biosolids production and reuse:

- Methane capture system
- Composting for reuse

### Disposal/reclamation/reuse:

- Use existing discharge for ocean outfall
- Challenge summer discharge prohibition
- Treat portion for reuse and then dispose
- Extract as much benefit before discharging



# Wastewater Facilities Plan Overview

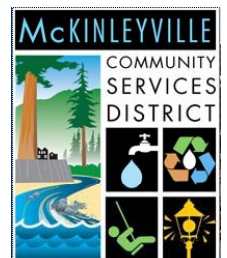
## Facilities Plan Goals:

Develop sustainable wastewater solutions for the MCSD wastewater collection, treatment and disposal systems.

Provide a detailed plan outlining a recommended alternative for Regional Board and funding agency consideration.

## Facilities Plan Outline:

- Part 1 – Background
- Part 2 – Operations Evaluation
- Part 3 – Project Feasibility
- Part 4 - Recommendations



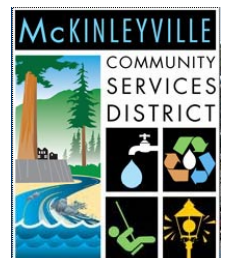
# Part 1 - Background

## Introduction

- Facilities Planning Process
- Purpose and Need

## Study Area Characteristics

- Study Area
- Physical Environment
- Socio-Economic Environment
- Land Use Regulations





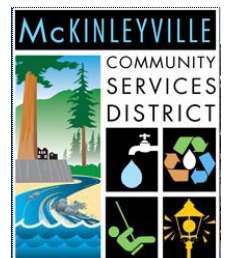
## Part 2 - Operations Evaluation

### Wastewater Characterization

- Influent Flow Analysis
- Wastewater Characteristics

### Existing Wastewater Facilities

- Wastewater Collection System
- Wastewater Treatment System
- Effluent Disposal System
- Land Reclamation System



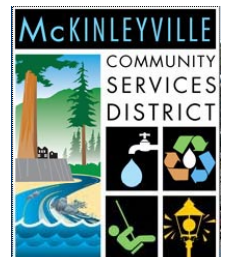
## Part 3 – Project Feasibility

### Basis For Planning

- Regulatory Requirements
- Basis of Design
- Basis for Cost Estimates

### Collection System Analysis

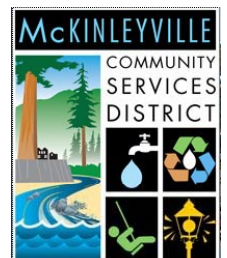
- Model Description
- Model Simulations
- Results



## Part 3 – Project Feasibility, continued

### Treatment Alternatives

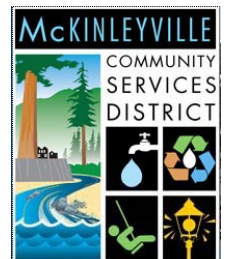
- Upgrade/Expand Existing Facultative System
- Extended Aeration System Processes (2)
- Activated Sludge System
- Membrane Bioreactors
- Comparison of Secondary Treatment Options
- New Headworks and Biosolids Management



## Part 3 – Project Feasibility, continued

### Disposal and Reclamation Alternatives

- New Reclamation Practices
- Existing Outfall to Mad River
- Municipal Reuse
- Ocean Outfall

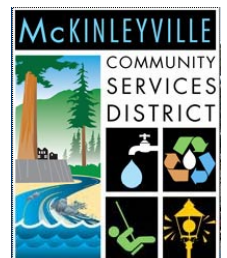
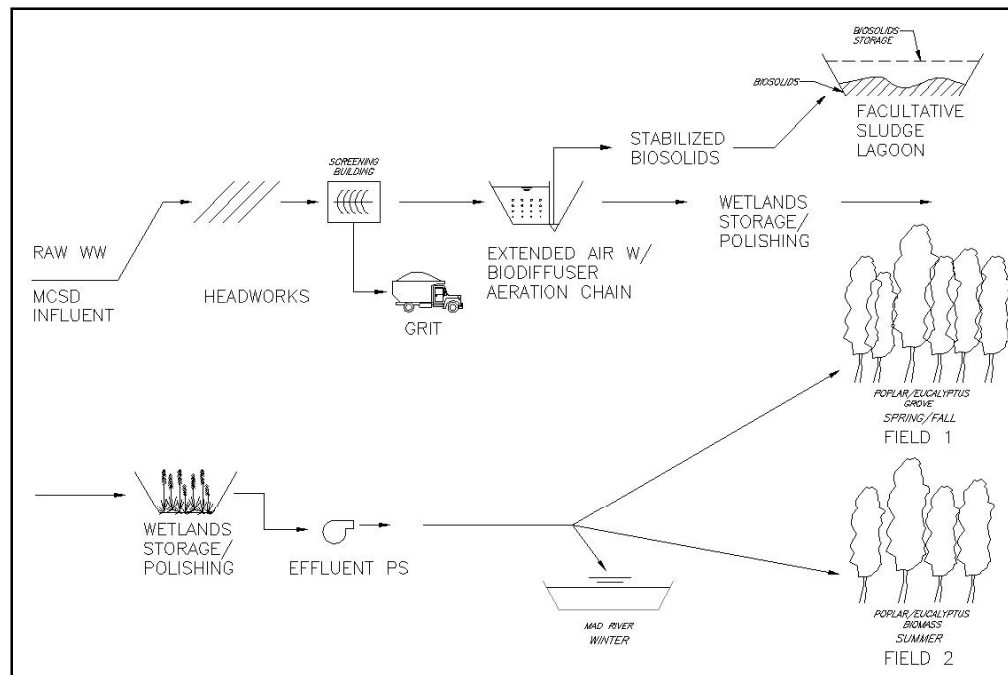


**SN**

## Part 4 - Recommendations

### Recommended Plan

- Collection System Improvements
- Treatment System Improvements
- Disposal and Reclamation System Improvements
- Project Cost Summary

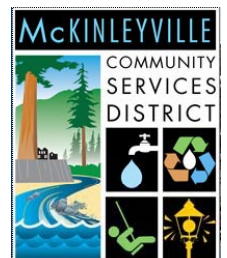


## Facilities Plan Objective

Provide a clear, feasible, and appropriate “road map” to capital improvements, upgrades, and maintenance of the District’s wastewater collection, treatment, and disposal facilities.

The plan is designed to be used in the development of a wastewater management system that:

1. addresses immediate permit requirements,
2. anticipates future permit and regulatory requirements, and
3. accommodates anticipated growth and community needs.



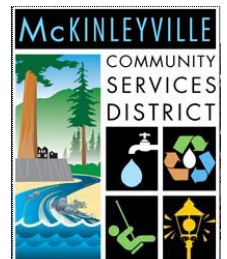
## Current Regulatory Issues

The current area of concern for the existing WWMF is the presence of high ammonia concentrations in treated effluent.

High nutrient loading is impacting the ability of the WWMF to consistently comply with current disposal and reclamation system requirements.



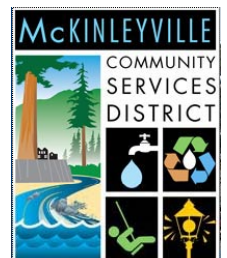
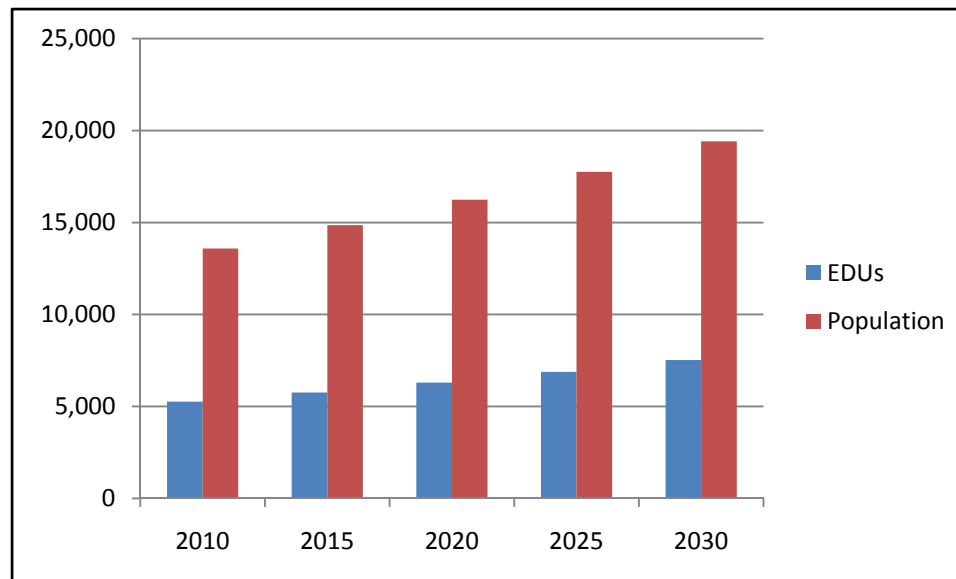
Although the current permit does not directly limit ammonia in effluent discharges, the District anticipates ammonia limits will be established in the next permit cycle.



## Population Growth Forecasts

McKinleyville is the most populated unincorporated area in Humboldt County and is one of the fastest growing communities in the county.

For purposes of the facilities plan, the average growth rate used to develop 20-year flow projections was based on an alternative growth rate presented by the County that projects a 1.8% annual increase in population in McKinleyville.





## Existing and Projected WWMF Flows

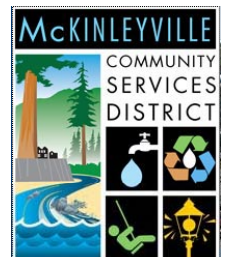
### Existing Flows

The average dry weather flow is approximately 0.9 MGD.  
The average wet weather flow is approximately 1.1 MGD.  
The peak day flow is approximately 2.0 MGD.

### Projected Flows (Year 2030)

The projected average dry weather flow is 1.4 MGD.  
The projected average wet weather flow is 1.7 MGD.  
The projected peak day flow is 3.1 MGD.

Projected 20-year flows for year 2030 were developed based on a 1.8% annual increase in population. MCSD staff have noted that the 1.8% growth rate is the annual average increase observed over the last 10 years.

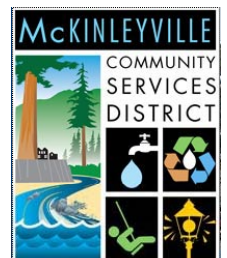


## Existing Wastewater Treatment System

The MCSD WWMF consists of a collection system, wastewater treatment facility, and effluent disposal and land reclamation system. The existing treatment system is a secondary treatment process that consists of three aerated ponds and one stabilization pond followed by a two-stage treatment wetland.



The average dry weather design flow of the treatment facility is 1.6 MGD and the wet weather design flow is 3.3 MGD.



# Existing Disposal and Reclamation System



## Monitoring Locations:

M-001: WWMF/CC Chamber

M-002: Mad River at Hammond

M-003: Percolation Ponds

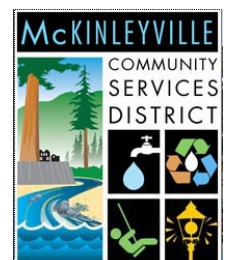
M-004: Lower Fisher Ranch

M-005: Upper Fisher Ranch

M-006: Hiller Wetlands Inflow

M-007: Pialorsi Ranch

M-008: Hiller Wetlands Outflow



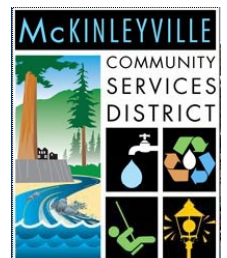
## **Existing Disposal and Reclamation System**

### **Discharge Period - October 1 through May 14**

Treated wastewater effluent is discharged to the Mad River, or, if the flow in the river is less than 200 cubic feet per second effluent is discharged to the percolation ponds adjacent to the river and/or to land for reclamation.

### **Discharge Prohibition Period - May 15 through September 30**

Treated wastewater effluent is discharged to the percolation ponds and/or to land for reclamation.

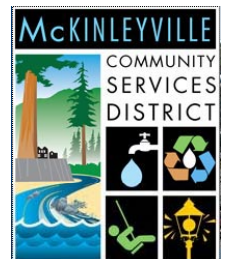


## Disposal and Reclamation System Limitations

Under current conditions wastewater reuse on the existing wastewater reclamation areas does not conform to the current waste discharge requirements for reclamation activities.

The Upper Fisher Ranch is not currently operated for reclamation; wastewater effluent is applied by overland flow irrigation methods in quantities that exceed agronomic rates.

Opportunities to increase irrigation on the lower pastures may balance these effects; however, based on current nitrogen loading rates, the existing available reclamation area is not sufficient to reclaim wastewater.

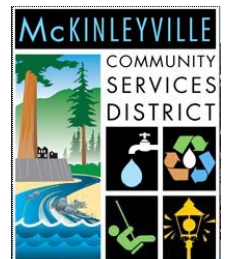


## Disposal and Reclamation System Limitations, cont.

In order to accommodate the land application of effluent, modifications to the existing practices will need to include:

1. a reduction in total nitrogen in the plant effluent, and
2. an increase of the crop cover's ability to use the available nitrogen being applied through land application.

The District also needs an alternative to the continued use of the existing percolation ponds for effluent disposal during the summer discharge prohibition period.



## Collection System Improvements

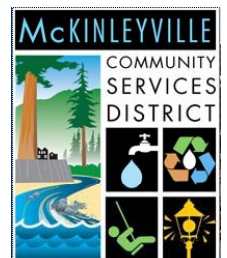
The central crossing (Line 5) and the southern crossing (Line 3) have been identified as the critical areas in the collection system that will require upgrades under projected flow conditions.

Recommended improvements to the collection system network include installing parallel pipe networks adjacent to each main line in these areas.



Additional improvements are recommended at the system lift stations.

Total costs for the proposed collection system upgrades were estimated to be \$3.4M.



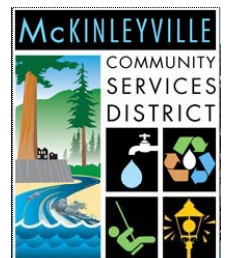
**SN**

## Treatment System Improvements

Secondary treatment alternatives were evaluated with regard to:

- treatment,
- cost,
- implementability,
- public acceptance, and
- regulatory issues.

Nitrogen removal, in addition to secondary treatment, was considered a priority.

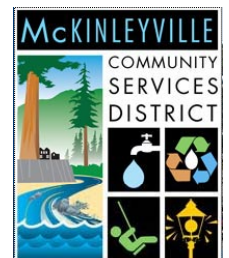
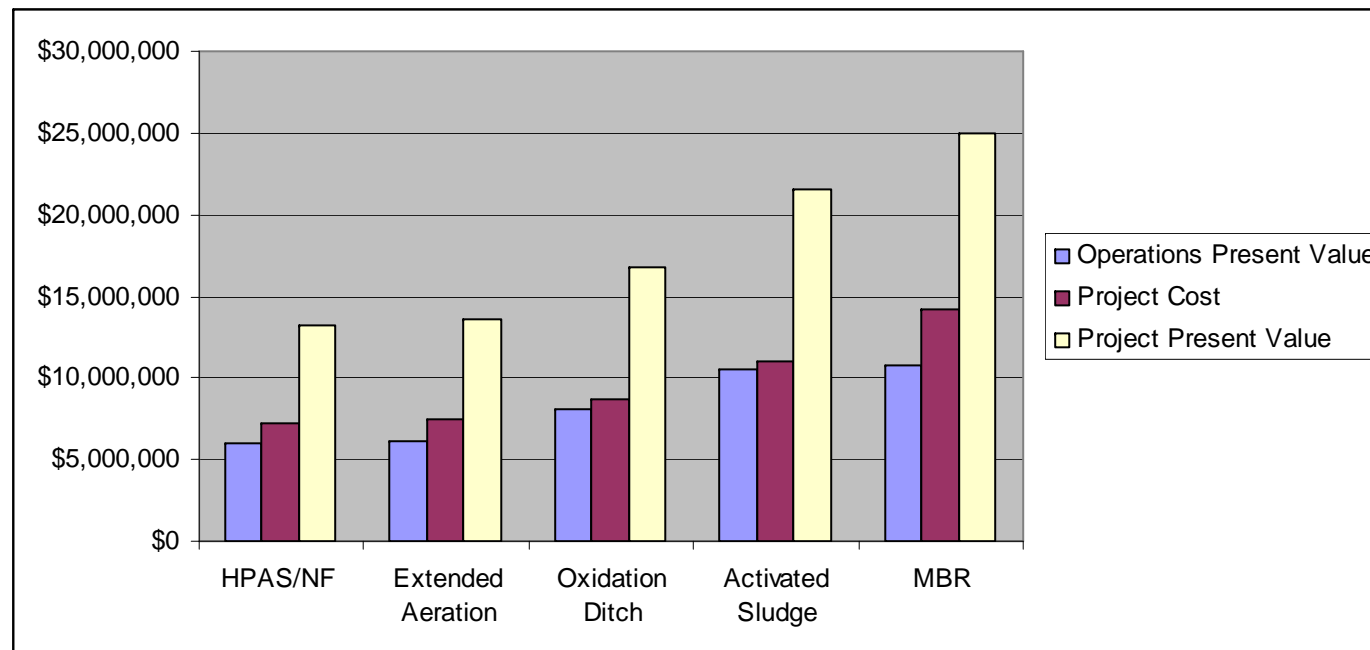




## Treatment System Improvements, cont.

Secondary treatment alternatives reviewed in detail included:

1. a high performance aeration system with a nitrifying filter;
2. an in-basin extended aeration system;
3. an oxidation ditch;
4. an activated sludge system; and
5. a membrane treatment system.



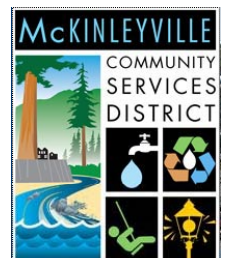
## Treatment System Improvements, cont.

The in-basin extended aeration system provides a high quality effluent that would reliably meet anticipated permit requirements for land application and discharge to Mad River.

Of the high reliability alternatives considered, the in-basin extended aeration system had the lowest capital and operational costs.

Costs for the in-basin extended aeration system were estimated to be \$7.4M.

Additional costs for a new headworks were estimated to be \$1.1M.



## Disposal and Reclamation System Improvements

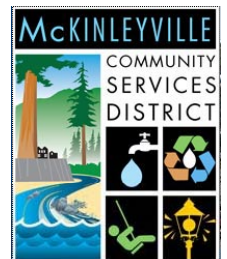
To increase reclamation capabilities at the land reclamation sites, installation of a poplar forest is proposed.

The proposed poplar forest disposal plan includes the planting of approximately 45 acres of the Lower Fisher Ranch with poplars in 4- to 5-acre plots.



If poplars replaced the current grass crop mixture on the Lower Fisher Ranch, total acreage efficiency could be increased by 130%.

Total costs for the proposed disposal and reclamation system upgrades were estimated to be \$1.9M.

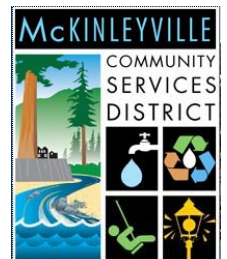


**SN**

## Total Anticipated Project Cost

Component	Description	Total Cost
Collection System	Gravity Mains/ Lift Stations	\$3.4M
Pre-treatment	Headworks	\$1.1M
Secondary Treatment	In-Basin Extended Aeration	\$7.4M
Disposal/Reclamation	Poplar Forest/ Pond Removal	\$1.9M
<b>Total Project Cost</b>	---	<b>\$13.8M</b>

The opinion of probable cost to complete the recommended WWMF collection, treatment and disposal/reclamation system improvements is approximately \$13.8M.

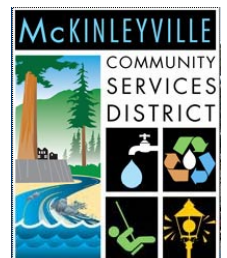


## Conclusions

The Facilities plan provides a clear, feasible, and appropriate “road map” to capital improvements, upgrades, and maintenance of the District’s wastewater collection, treatment, and disposal facilities.

Of the alternatives reviewed, the in-basin extended aeration system provides a high quality effluent that would reliably meet anticipated permit requirements for land application and discharge to Mad River.

This secondary treatment system upgrade, coupled with improvements to the existing land reclamation practices, should enable the WWMF to consistently meet or exceed regulatory requirements over the 20-year planning horizon.



## Next Steps...

The Administrative Draft of the Facilities Plan was presented to the MCSD Board on October 19, 2011.

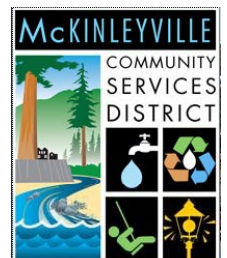
The plan will be submitted for MCSD Board approval in January 2012, pending no significant changes.

Following MCSD Board approval, the plan will be submitted to the Regional Board.

In addition to review by the MCSD Board, the Facilities Plan is available to the general public on the MCSD website for review and comment.

The public comment period started on October 19, 2011 and will end on December 14, 2011.

The public is encouraged to provide comments to MCSD for consideration during the review and comment period.



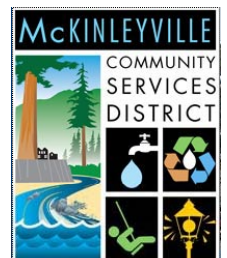
## Next Steps, continued...

A Final Facilities Plan will be submitted to the Regional Board for review and comment.

Following Regional Board approval, the District will need to initiate the planning, design, and permitting phases of the Preferred Project.

This work will include completing the following:

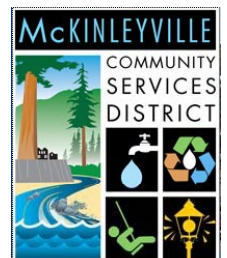
1. Design Team Review and Selection (2012)
2. Preliminary Engineering Design (2013)
3. CEQA Review (2013)
4. Final Design (2014)
5. Project Permitting (2014)
6. Construction (2015)
7. NPDES Permit Renewal (2016)



## Overview of General Comments to Date

The following general comments on the plan were noted during the MCSD Board meeting:

1. Incorporation of Public Input from 2010
  - Wetlands Treatment
  - Municipal Reuse
  - Ocean Outfall
  - Modular System
2. Selection of Designated Growth Rate
3. Pilot Project Results for Poplar Study
4. Odor Concerns for Selected Alternative





## Incorporation of Public Input from 2010

### 1. Wetlands Treatment

- Addressed in Section 7.2

### 2. Municipal Reuse

- Addressed in Section 8.3

### 3. Ocean Outfall

- Addressed in Section 8.4

### 4. Modular System

- Regulatory Requirements vs. Capacity-Driven Upgrades

**Thank You!**

