

# **HAYDEN AREA REGIONAL SEWER BOARD**

## **PHOSPHORUS PROGRAM UPDATE**

**APRIL 2014**



**Ken Windram Administrator**



# **HARSB PHOSPHORUS PLAN**

- **FLOW EQUALIZATION**
- **BIOLOGICAL NEUTRIENT REMOVAL**
- **TERITARY TREATMENT**

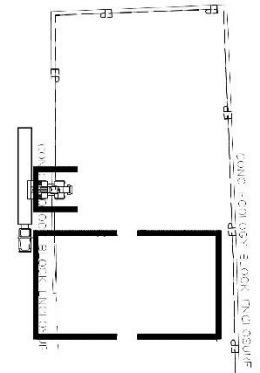
# HAYDEN AREA REGIONAL SEWER BOARD BIOLOGICAL NUTRIENT REMOVAL UPGRADE

HEADWORKS

EQUALIZATION  
TANK

BIOLOGICAL  
NUTRIENT  
REMOVAL  
TANKS

ADMINISTRATION  
BUILDING



ATLAS ROAD



# WATER REUSE



**NPDES PERMIT REQUIRES NO SPOKANE  
RIVER DISCHARGE WHEN RIVER FLOW  
ARE LESS THAN 2,000 CFS @ POST FALLS**



# HARSB REUSE WATER FARM



- 246 ACRES IN LIVESTOCK CROPS
- 57 ACRES IN POPLAR TREES





# Advanced Hardwood Biofuels Northwest

## Growing Hardwood Energy Crops



Poplar cutting 8 weeks old

### Why hybrid poplar?

The fast-growing nature of hybrid poplar makes them an excellent crop for biofuel production. These trees are able to thrive on underutilized lands that are not ideal for other types of crops. The hybrid poplar cultivars being developed are bred through traditional time-tested methods of controlled pollination, grown on very-short (2 year) rotations, and harvested using a coppicing method that promotes multiple shoots of regrowth at the stump for subsequent harvests.



Poplar saplings after 2 growing seasons



Alder 6 months old. May be more suitable for higher elevations



Harvesting Poplar in Hayden, Idaho

## The Future of Transportation Fuels

### Hybrid Poplar for Biofuels Demonstration Sites



### Advanced Hardwood Biofuels Northwest (AHB)

AHB is a USDA-funded consortium of universities and industry partners working to develop a Pacific Northwest (PNW) biofuel industry based on sustainably grown hardwood energy crops.

#### Project goals

- ❖ Provide 100% renewable and infrastructure-compatible drop-in transportation fuels
- ❖ Strengthen the PNW region's capacity to meet renewable fuels standard
- ❖ Ensure economic and environmental sustainability
- ❖ Create new jobs and economic opportunities

### Why biofuels from hardwoods?

- ❖ Energy independence and security
- ❖ Environmental concerns of increasing level of fossil fuels use
- ❖ Economic progress and sustainability by utilizing renewable resources
- ❖ Meeting Renewable Fuel Standard (RFS)- more advanced biofuels from cellulosic biomass feedstocks



### Sustainable transportation fuels

Go where you grow



### What kind of future we envision?

- ❖ Significant amount of energy coming from renewable sources including hardwoods ensuring energy independence and security
- ❖ Reduced carbon emissions and other environmental concerns
- ❖ Moving forward ensuring sustainability, economic progress, and prosperity

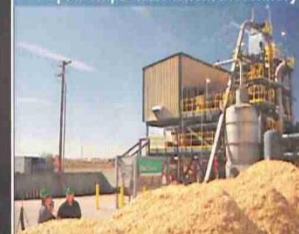


United States Department of Agriculture National Institute of Food and Agriculture

This project is supported by an Agriculture and Food Research Initiative (AFRI) Competitive Grant no. 2011-68005-30407 from the USDA National Institute of Food and Agriculture (NIFA)

## Conversion to Biofuels

### Poplar chips at ZeaChem biorefinery



### Poplar feedstock

Poplar can be stored on the stump instead of in silos as other biofuel crops. The poplar can then be harvested, chipped and sent to the biorefinery as needed.



ZeaChem, Boardman, OR

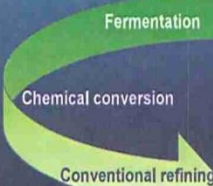
### Pretreatment

At the biorefinery poplar chips are pretreated by hydrolysis. The resulting sugars are sent to fermentation.



Researching pretreatment

### Conversion



### Transportation fuels

The end product is a renewable drop-in liquid transportation fuel that is fully compatible with existing infrastructure.



Bio-based gasoline, diesel



And jet fuels!



# QUESTIONS

