



City of Lemoore



# Wastewater Reuse Study ~ Final Options



Presentation to the  
Lemoore City Council

March 15, 2011

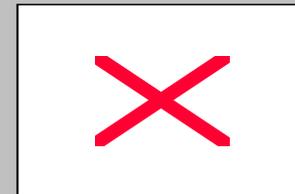




# Wastewater Reuse Study

## Acknowledgements

- The key goal of this Study was to explore and identify long-term wastewater reclamation options.
- This Study was made possible with funding from the U.S. Economic Development Administration (Award #07-79-05984).

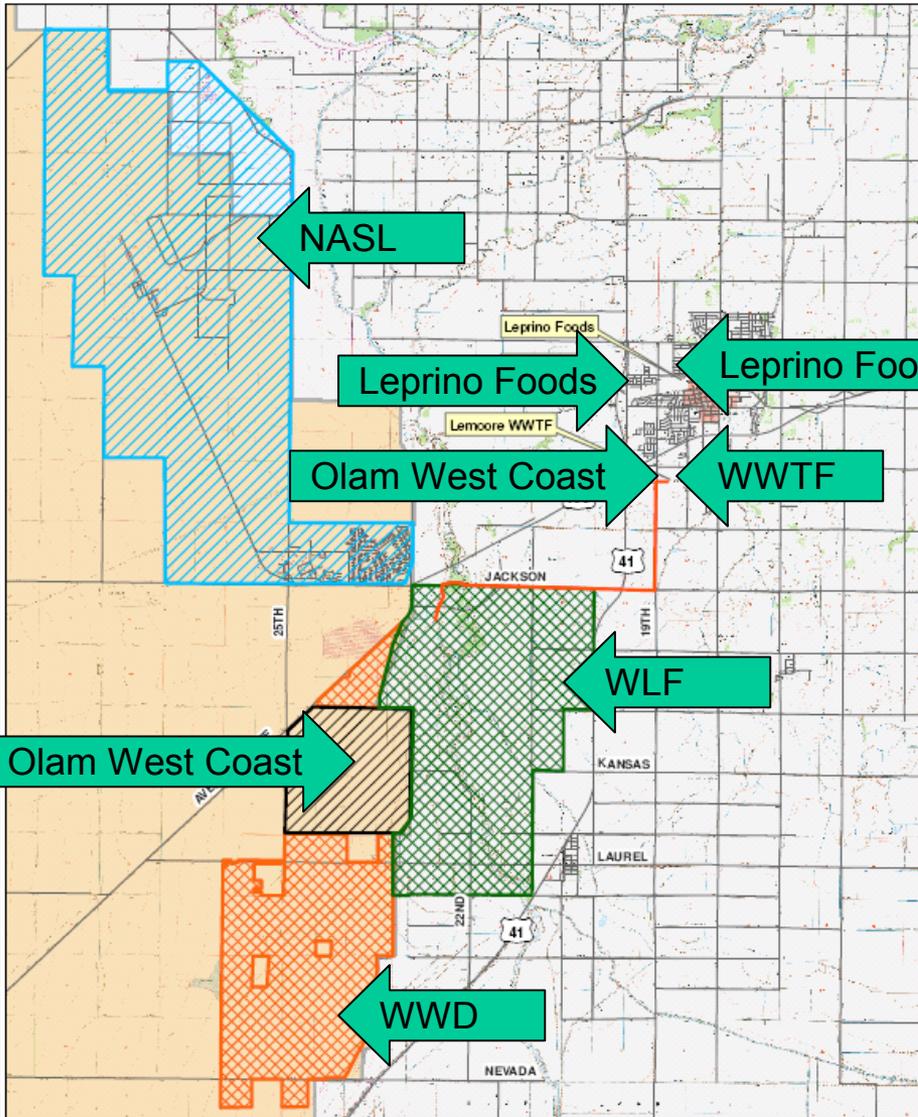




# Study Objectives

- Minimize the long-term capital and operating costs for the City and its customers.
- Maximize the beneficial reuse of effluent for crop production.
- Allow the City to remain in compliance with regulatory requirements.

# Background



- City of Lemoore WWTF
- Leprino Foods
- Olam West Coast
- Westlands Water District
- Naval Air Station Lemoore
- Westlake Farms



# Background

- All treated effluent is currently conveyed to and used by Westlake Farms.
- Effluent is blended with irrigation water and used to grow crops.
- The City intends to continue discharging to Westlake Farms.
- However, it is imperative that the City identify long-term and economically sustainable options to control the reclamation discharge.



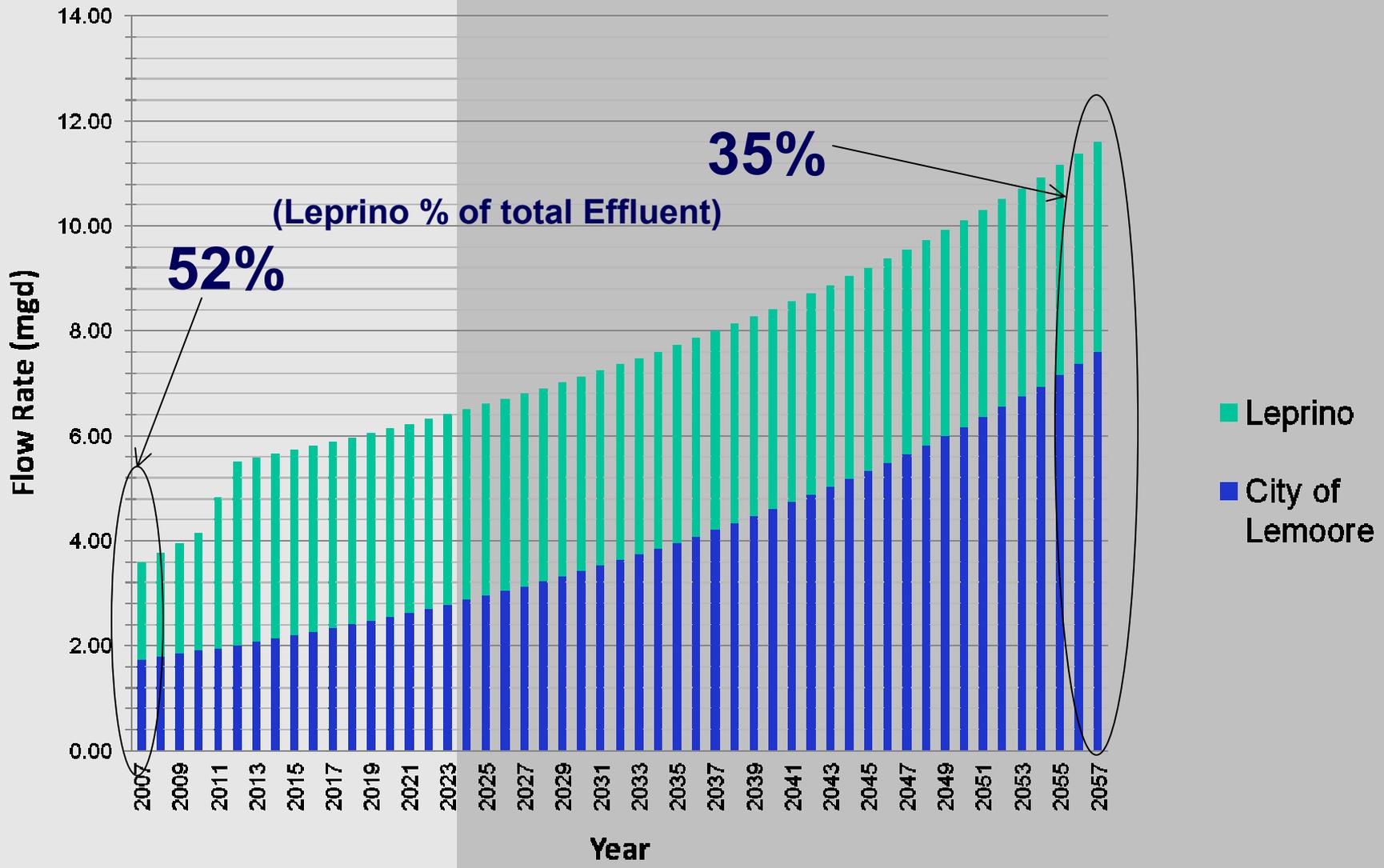
## Effluent Production

- 2 wastewater treatment streams – City municipal & Leprino.
- 2010 wastewater combined flow averaged 4.15 mgd.
- 2057 wastewater combined flow projection o 11.6 mgd.



# Effluent Background

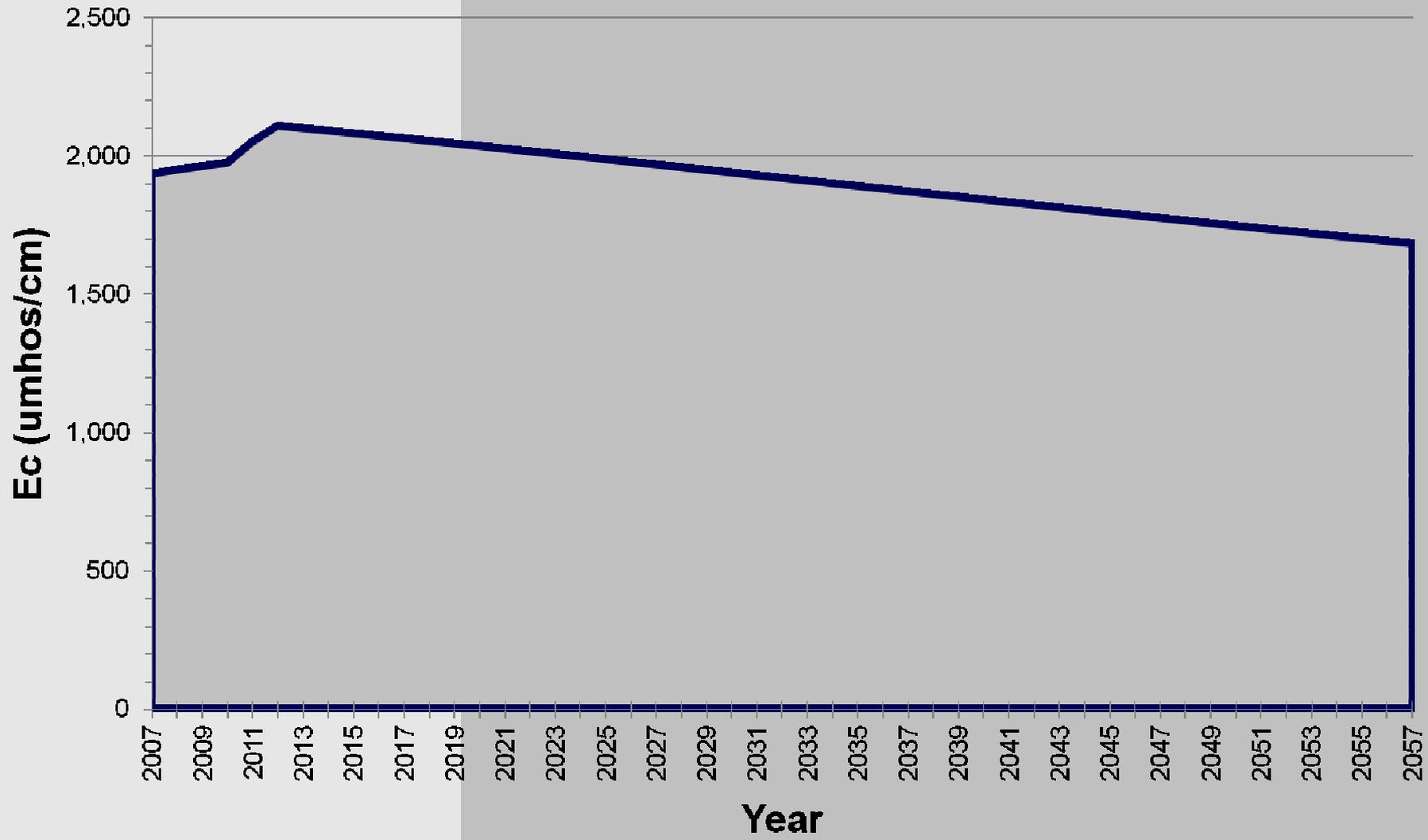
## Effluent Flow Rate Projection



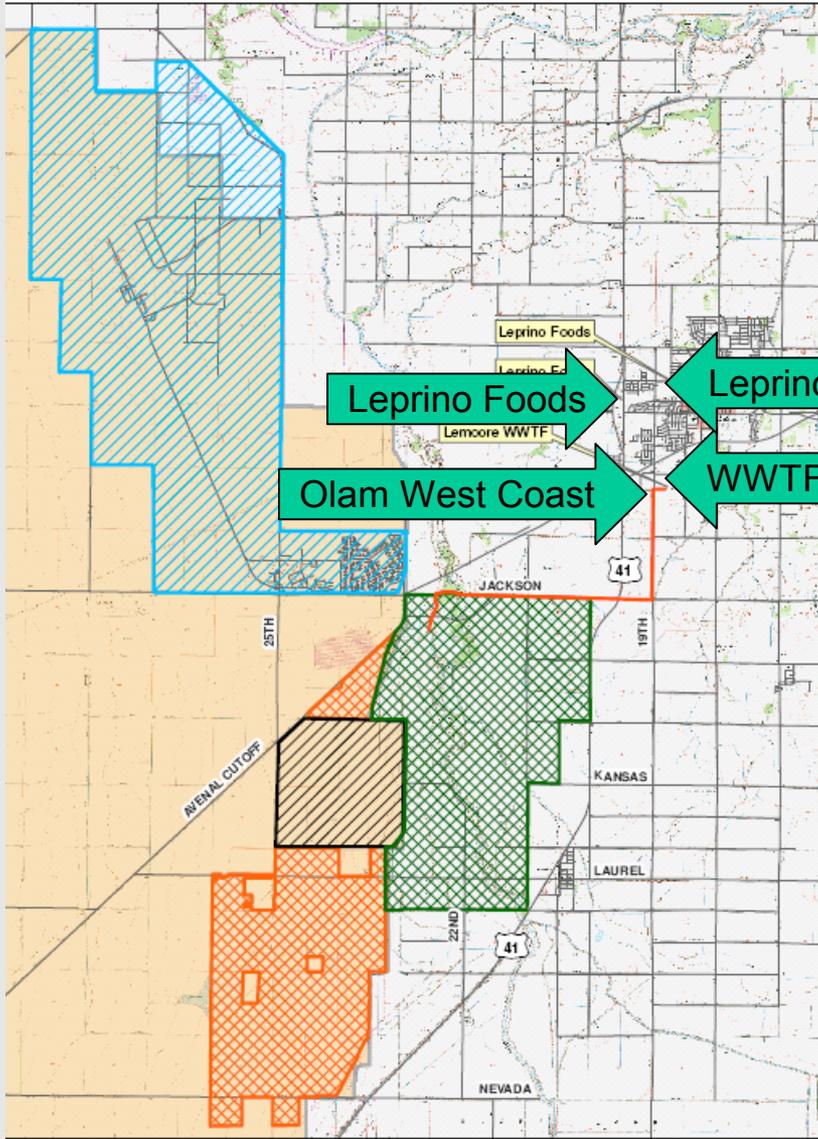


# Effluent Background

## Effluent Ec (Salt) Projection



# Conveyance System



## City of Lemoore WWTF

- Conveyance system consists of a 6-mile long 30" pipeline.
- Pipeline discharges into the Westlake Canal.
- Pipeline gravity flow capacity is 5.5 mgd, pressurized flow capacity is much greater.



# Study Area ~ Conditions & Needs

## Conditions

- Effluent Production and Quality
- Cropping Options
- Property Ownership
- Topography
- FEMA Floodzone
- Soil Data
- Groundwater
- Effluent Conveyance
- Irrigation Constraints
- Storage Needs



# Study Area ~ Conditions & Needs

## **Narrowed to 3 Study Areas**

- Study Area 1 - Westlands Water District
- Study Area 2 – Naval Air Station Lemoore
- Study Area 3 – Westlake Farms

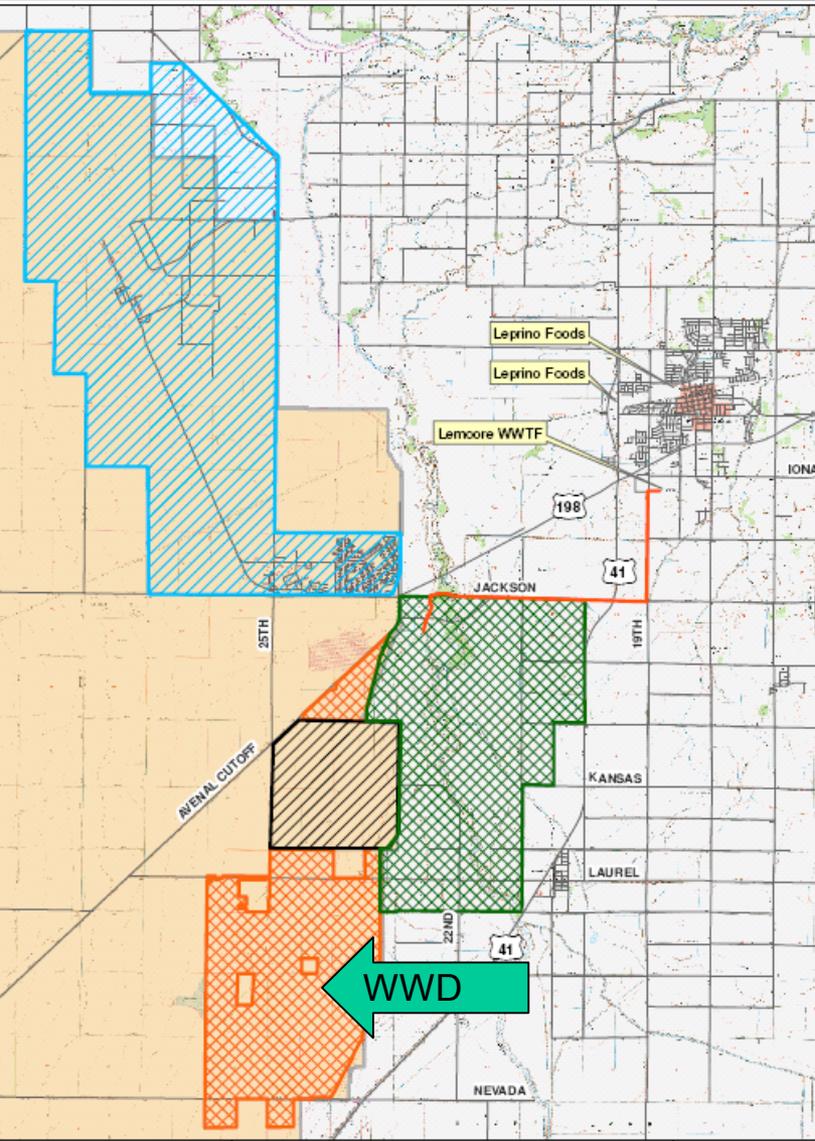
## **Key Determinations**

- Reuse Area Needed
- Cost Estimate



# Study Area Groundwater Conditions

- Shallow groundwater EC ranges from 4,000 to 20,000 umhos/cm with most areas under 10,000 umhos/cm.
- Perched groundwater areas to a depth of 10 feet.

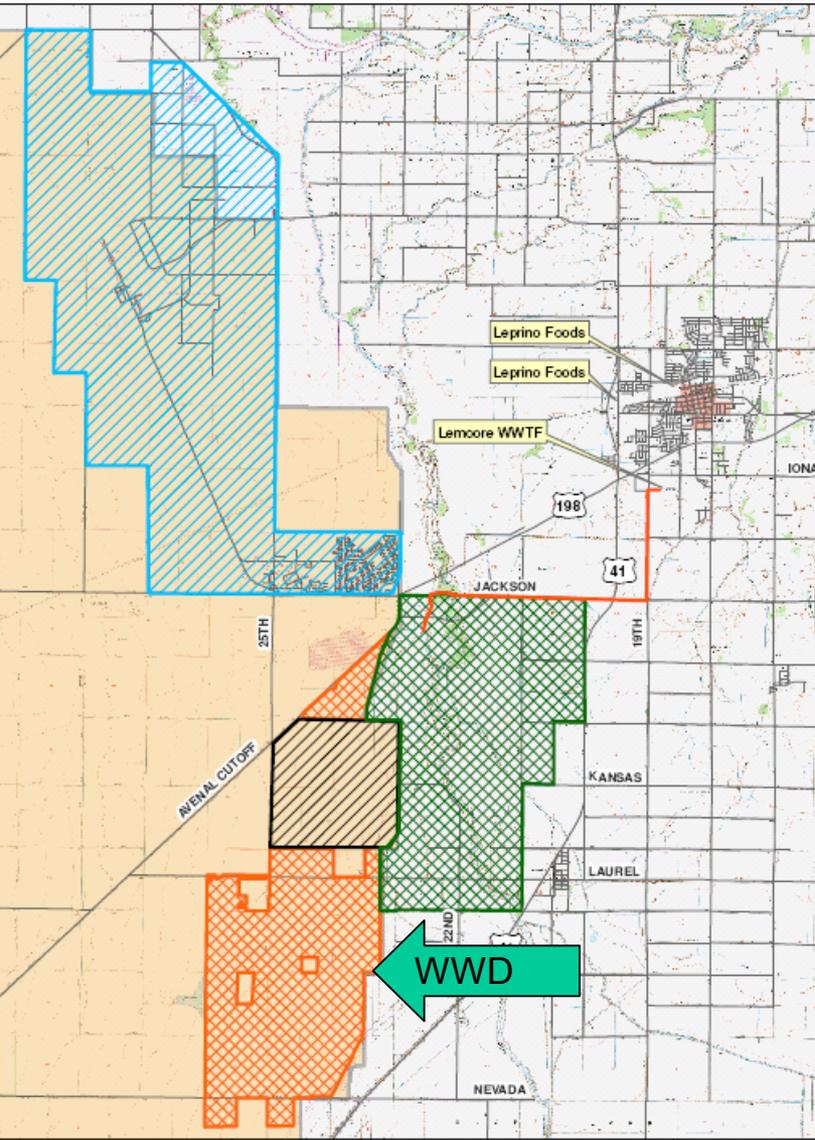


## WWD Agreement

- No WWD water allocation.
- West half sections limited to drip, micro, sprinkler or dryland farming.
- East half sections, ok for flood irrigation.
- Limited to average 2 af/ac.
- GW wells limited to 3,200 gpm on property and must pump above Corcoran Clay.
- Property not eligible for drainage service..



# Study Area 1 - WWD



## Westlands Water District

- Importing other water is conditional.
- Approximately 9,000 total acres available.



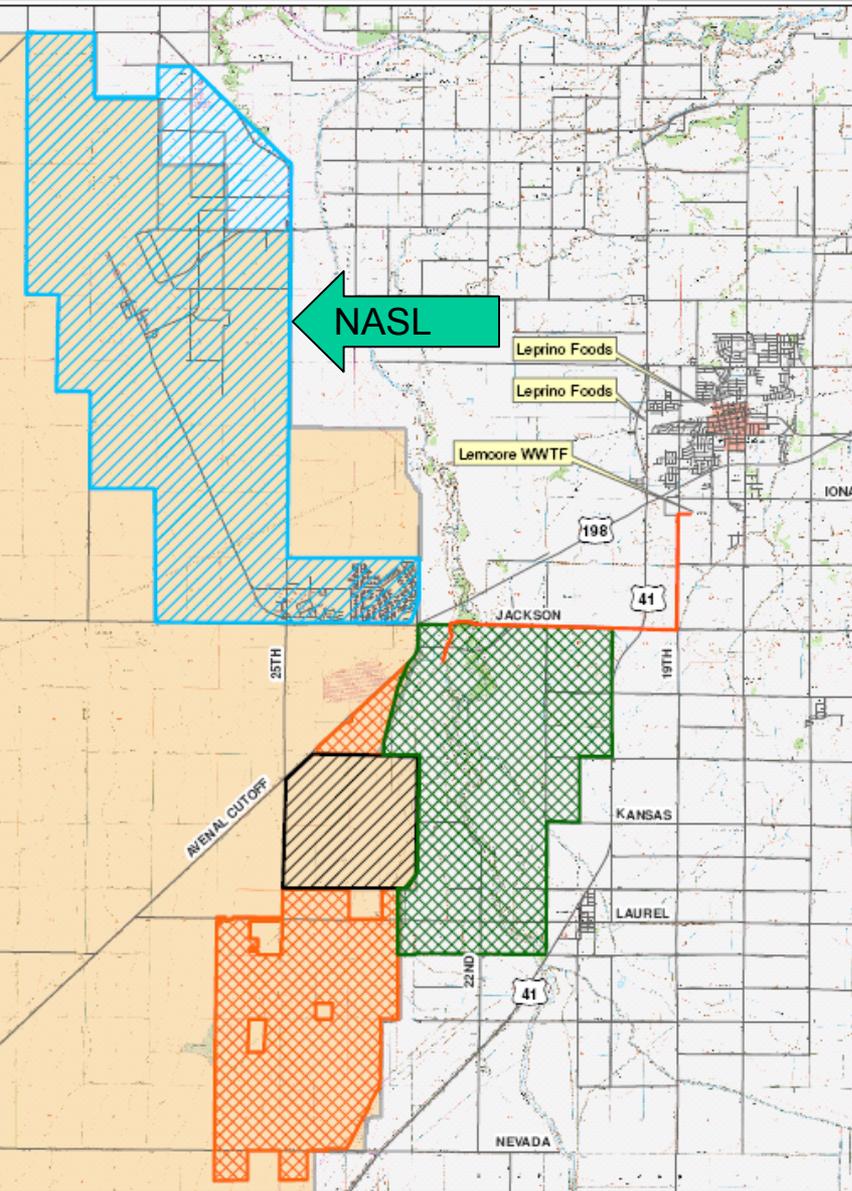
# Study Area 1 - WWD

## Westlands Water District

- Summer Sudan grass and winter Barley.
- Pumps needed to deliver water.
- Supplemental fresh water needed.
- Additional pipeline for on-farm distribution system.
- Westlands has decided not to sell the property to the City at this time. Could be a future option.

Year	Effluent Flow Rate	Reuse Acreage Needed	Cost Estimate
2010	4.15 mgd	2,250	\$16.3m
2030	7.12 mgd	3,800	\$27.1m
2057	11.60 mgd	5,400	\$35.2m

# Study Area 2 - NASL



## NAS - Lemoore

- Crops for reclamation include cotton, alfalfa, and Sudan grass/barley, rotating annually.
- From existing pipeline construct new pipeline to blend with WWD supply.
- Study Area 2 consists of approximately 11,700 acres of farm land.

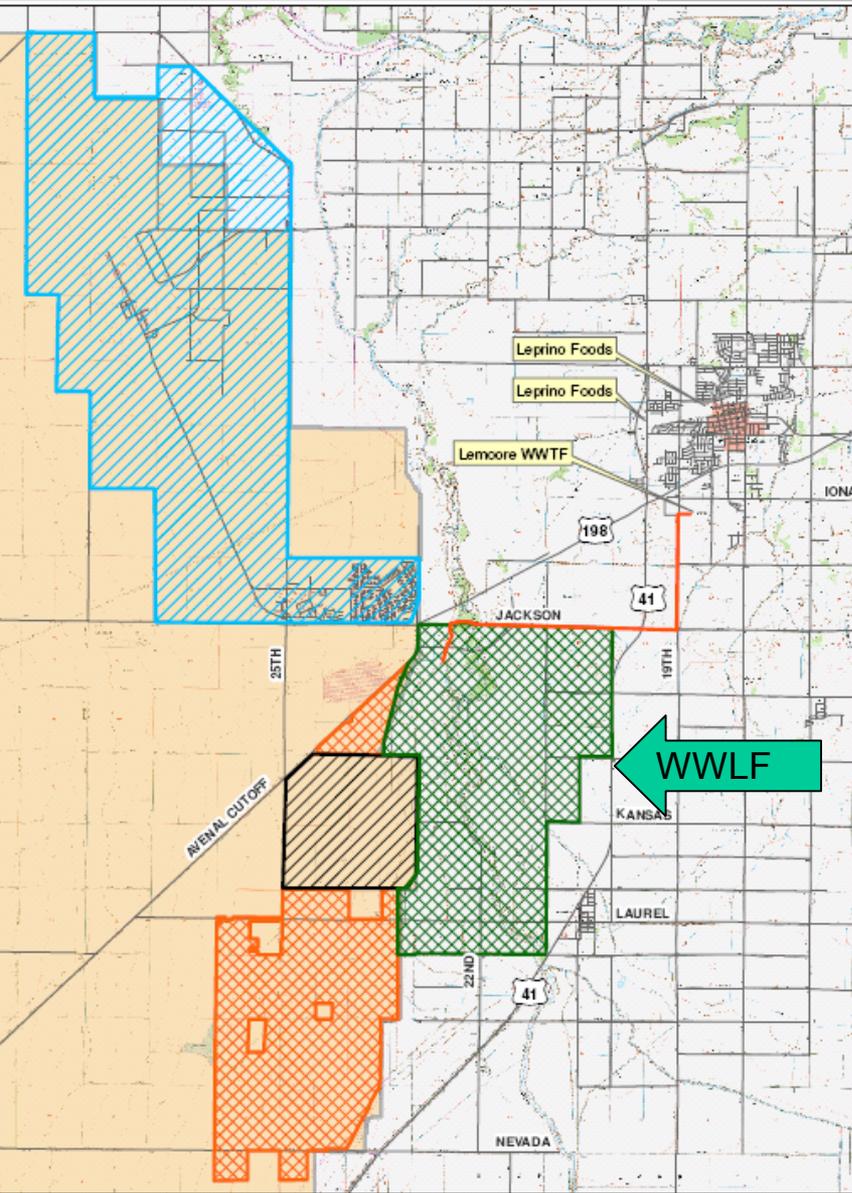


# Study Area 2 - NASL

- Land is not for sale but could possibly be secured with a long-term wastewater agreement.
- Additional pipeline needed for on-farm distribution system.
- NASL growers are hesitant to utilize effluent to grow crops.
- Wastewater would be pumped uphill.

Year	Effluent Flow Rate	Reuse Acreage Needed	Cost Estimate
2010	4.15 mgd	2,245	\$17.0m
2030	7.12 mgd	3,961	\$21.4m
2057	11.60 mgd	5,363	\$29.7m

# Study Area 3 - Westlake Farms



## Westlake Farms

- The total Study Area is 7,900 acres.
- Westlake Farms owns 3,900 acres.
- 27 different land owners.
- Purchase contiguous land or establish wastewater agreements with land owners.

Year	Effluent Flow Rate	Reuse Acreage Needed	Cost Estimate
2010	4.15 mgd	2,250	\$18.2m
2030	7.12 mgd	3,800	\$24.6m
2057	11.60 mgd	5,400	\$33.6m



# Considerations

- Selected option needs detailed design, permitting, and construction cost estimates, in conjunction with treatment plant construction.
- Project can be implemented in phases as the flows increase over time, but purchase all the land upfront.
- This Study provides the necessary background and support information to move forward on a future long-term sustainable option for wastewater reclamation.



# Recommendations

- Consider industrial salt studies to determine if operational changes can reduce effluent EC.
- Continue discharges to Westlake Farms until no longer allowed or available.
- It is recommended that the City Council accept the completion of the Wastewater Reuse Study.



Q&A