

**Illinois EPA's Best Operated Plant of 2010!**

**UCSD  
Southwest Plant  
Champaign, IL**

# How Much is 2 Billion Gallons of Reused Effluent Worth?

**RICK MANNER**

**URBANA & CHAMPAIGN SANITARY DISTRICT**

**ILLINOIS RIVER CONFERENCE**

**OCTOBER 28, 2015 IN PEORIA, IL**



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# Background

- Buyer would be Cronus Fertilizers, LLC
- Potential **\$1.2+** billion urea fertilizer plant
  - Largest private investment in central IL since Mitsubishi/Diamond Star
  - 170 permanent jobs, 1,500+ construction jobs
  - Located west of Tuscola
  - Natural gas pipelines converge at Tuscola
  - Tuscola region lacks major water supply or storage
  - Needs 4,400 gallons per minute =  
6.3 million gallons per day =  
**2.3 billion gallons per year**

# Background

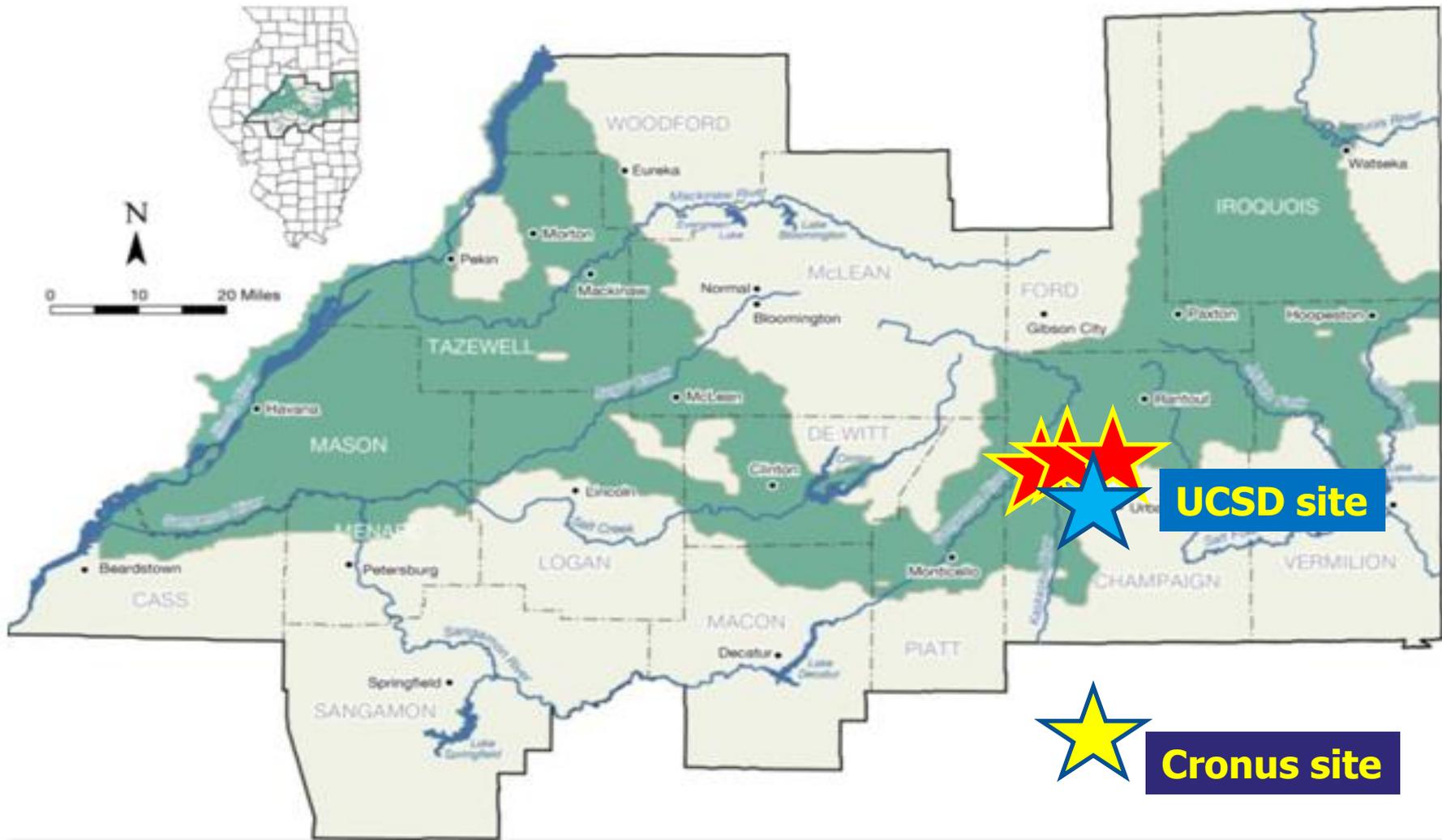
- **Sale of fully treated sewage, or effluent, from UCSD**
  - **Avoids pumping new water from Mahomet Aquifer**
    - Cronus prefers reuse – not common
    - Avoids pumping water from Kaskaskia River
    - Matches lower-grade water with lower-grade use
    - Reduces overall pollutant loading

# Background

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- Avoids pumping new water from Mahomet Aquifer
  - Cronus prefers reuse
  - Avoids pumping water from Mahomet Aquifer

Sole Source for ~1 million people.  
Deepest cone of depression  
near Champaign.

# Mahomet Aquifer



# Location

- 20 miles between sites
- 200 square miles in picture
  - No large water resources





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    - except groundwater or UCSD

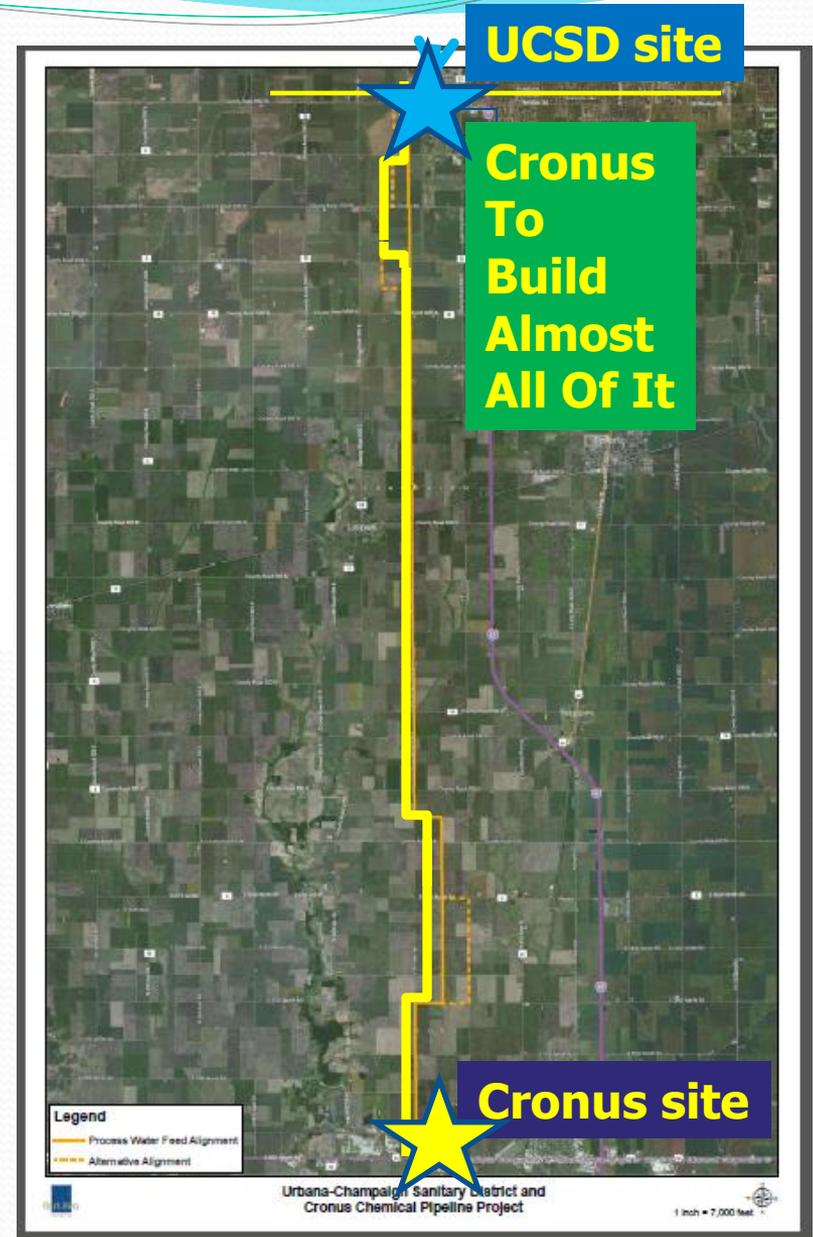
(SW Champaign) ← UCSD SWP



(Tuscola 3 mi. →) ← Cronus site

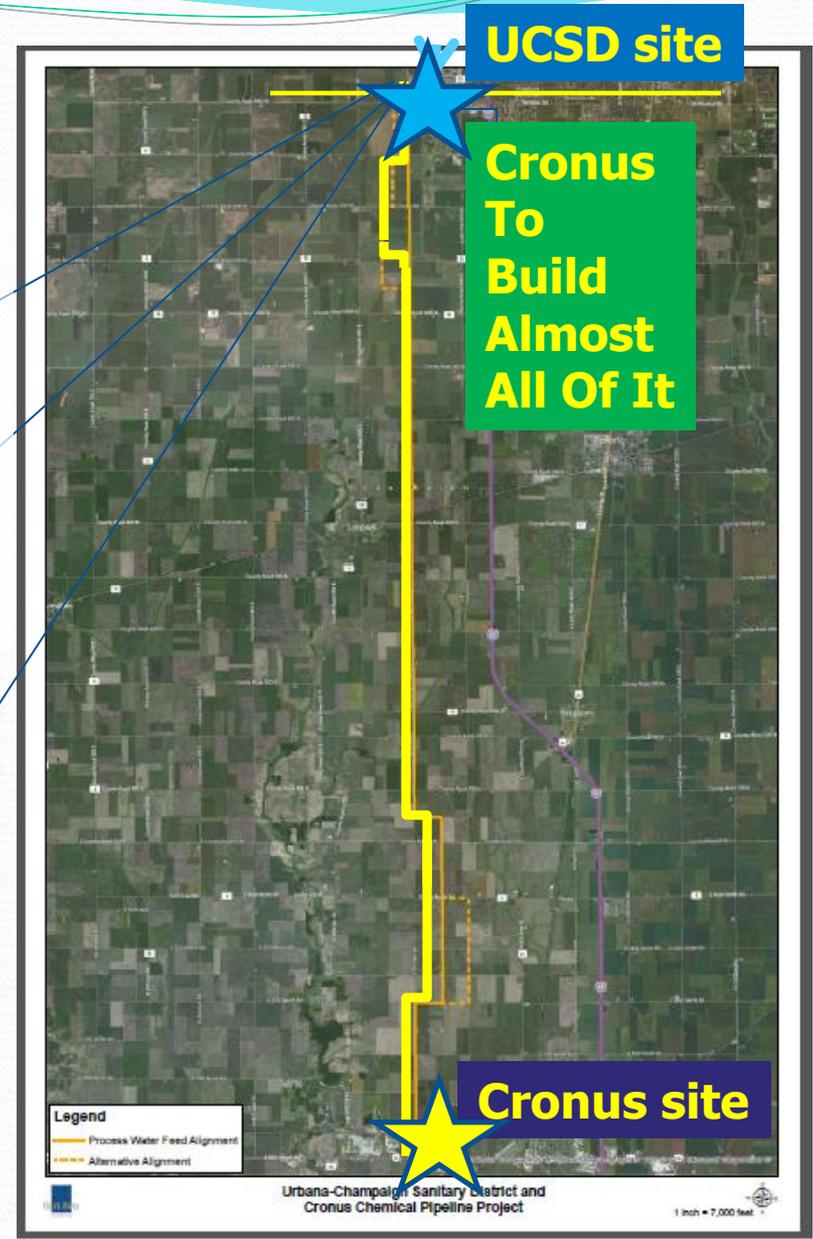
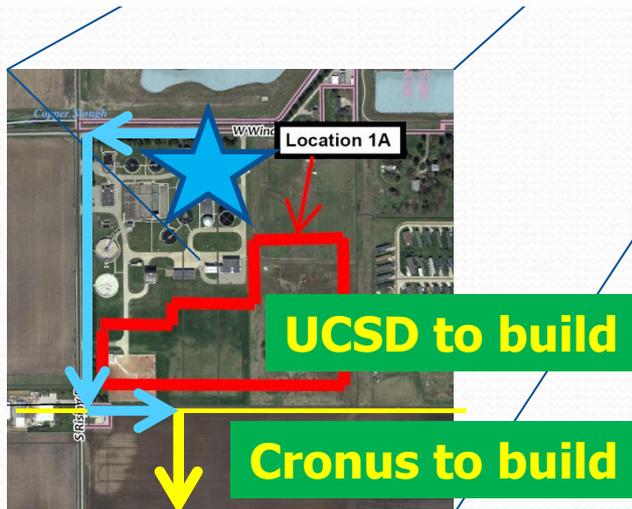
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- Cronus' responsibility after UCSD fence line



# Water Usage and Quality

- **80% of water would be evaporated for cooling**
  - Natural gas and nitrogen from the air are urea's primary ingredients
- **Effluent quality is important** – UCSD effluent very good fit
  - Particulates, phosphorous, and chlorides are key parameters
  - Filtered effluent, bio-P facility, drinking water is lime-softened
  - But contract DOES NOT include a quality or quantity guarantee
    - *UCSD is a Sanitary District, that happens to sell effluent...*



# \$0 vs. Income vs. Subsidy

- Currently we receive **\$0** from effluent discharge to creeks.
- **What does “The Market” tell us?**
  - Almost nobody buys effluent around here.
    - \$10,000 per year for unlimited volume
    - \$0.10/1,000 gallons, \$0.25/1,000 gallons
  - In arid areas they “charge” more, but the net rate is a subsidy.
  - Fracking water can be as high as \$70/1,000 gallons
    - Very limited volume and duration. NOT a valid comparison



**\$0 vs**

**?**



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\$0 vs



?



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# Avoided Costs, Shared Benefit

- Creek water and other sources unavailable or unacceptable.
- **Drinking water from aquifer about \$3/1,000 gallons**
  - Pipeline built by drinking water company
  - Raw groundwater option about \$2/1,000 gallons
- **UCSD base rate about \$1/1,000 gallons**
  - Pipeline by Cronus (cost of ~\$1.00/1,000 gallons)
  - Pumps and storage basin via Cronus contribution (~\$0.30/1,000)
  - Financial guarantees to UCSD (very significant concern)
  - Potential need for treatment due to effluent quality
  - Risk of unknown



# Primary Financial Terms

- **Bottom line = ~\$1 million / yr net benefit**
  - ~7 to 10% of total UCSD income from Cronus
- **Ratepayer protection from “What if... ???”**
  - UCSD’s initial expenses have been reimbursed
  - Before start, UCSD receives **\$10 million Letter of Credit**
  - After sales start, “Take or Pay” 5.5 MGD = \$2 million/yr
    - Letter of Credit, declines, disappears after \$13 million in sales
    - Sales income allows for expenses, plus \$25 million in projects
    - Financial assurances work at Take or Pay - but we expect better



# Primary Flow Terms

- **Creeks get first 6.0 million gallons per day (MGD)**
- **Flow to Cronus typically is next 6.3 +/- MGD**
  - Flow rate to Cronus can be reduced by UCSD
  - Lower charged rates when less than 5.5 MGD available for Cronus
    - UCSD to build storage basin for this and daily variation in drought
- **Remaining/balance of flow goes to creeks**
  - 5 to 15 MGD in normal weather, 0 MGD in deepest drought
    - Selling to others is now all but impossible
      - We're "OK" with 2 "customers"
- **UCSD to fund habitat projects at \$50,000/yr**



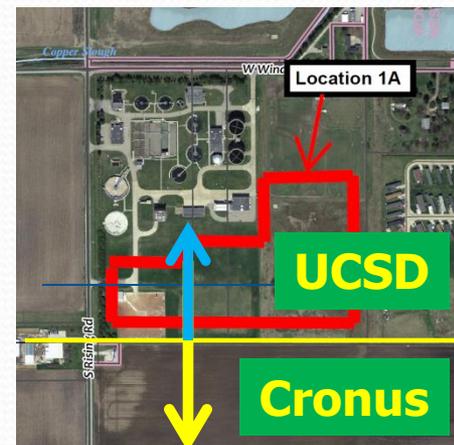
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# Other Terms

- **UCSD owns, operates within SW Plant**
- **Cronus builds anything downstream**
  - Design, Builds & Operates 20 mile pipeline
    - Easements took 18 months and threat of Eminent Domain
    - **WRRDA = State Revolving Loan Funds now an option for reuse**
- **20 year initial term**
  - Expect to renew repeatedly
  - Contract is binding on future owners
    - Only approved effluent buyer is a fertilizer plant





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# How People Recycle Effluent:



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# Thanks!



**Reduce**  
**Reuse**  
**Recycle**



That order is the preferred hierarchy



# Reasons People **DON'T** Reuse Effluent

## 1a. Effluent quality

## 1b. Economics

*Net is often higher cost, for less quality.*

*Such a deal!*

## 2. Regulations

## 3. Perceptions

## 4. Habit



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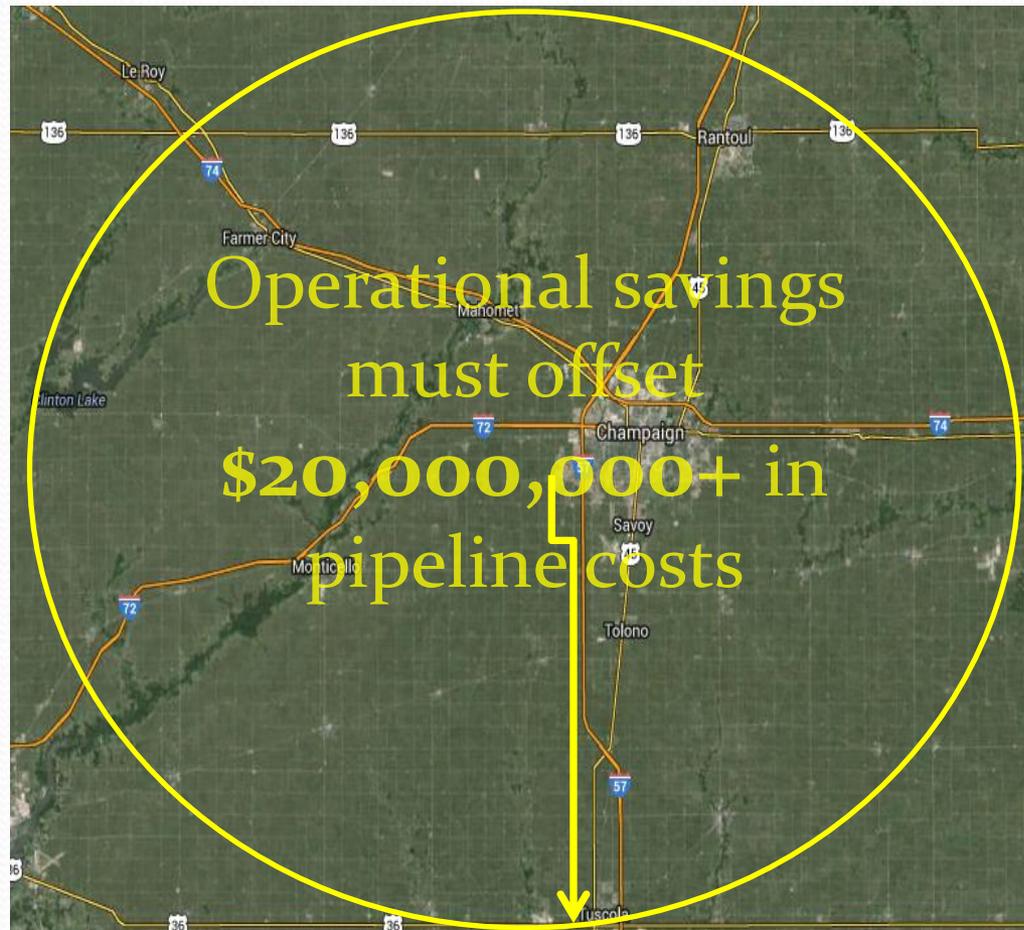
**4. Habit**



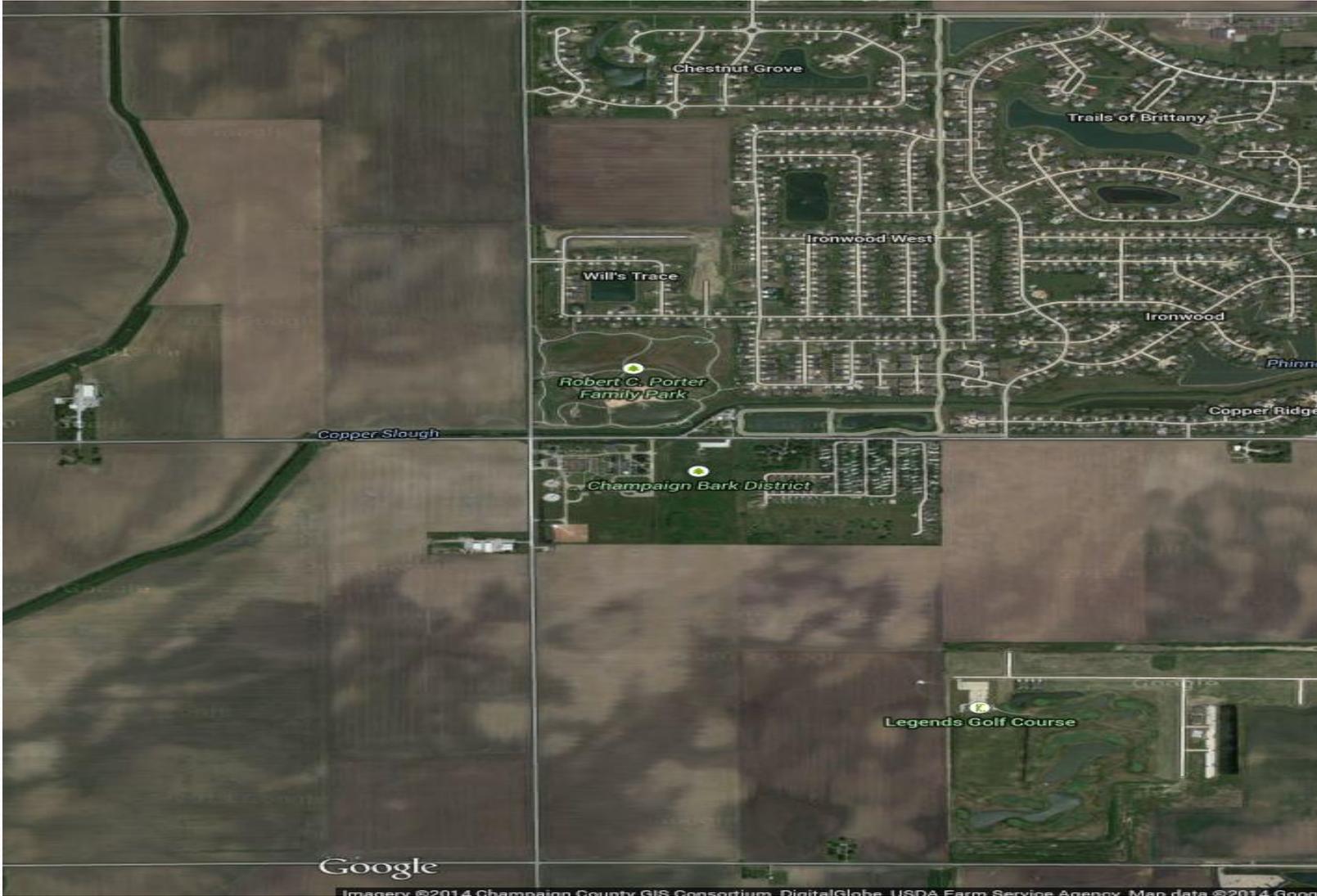
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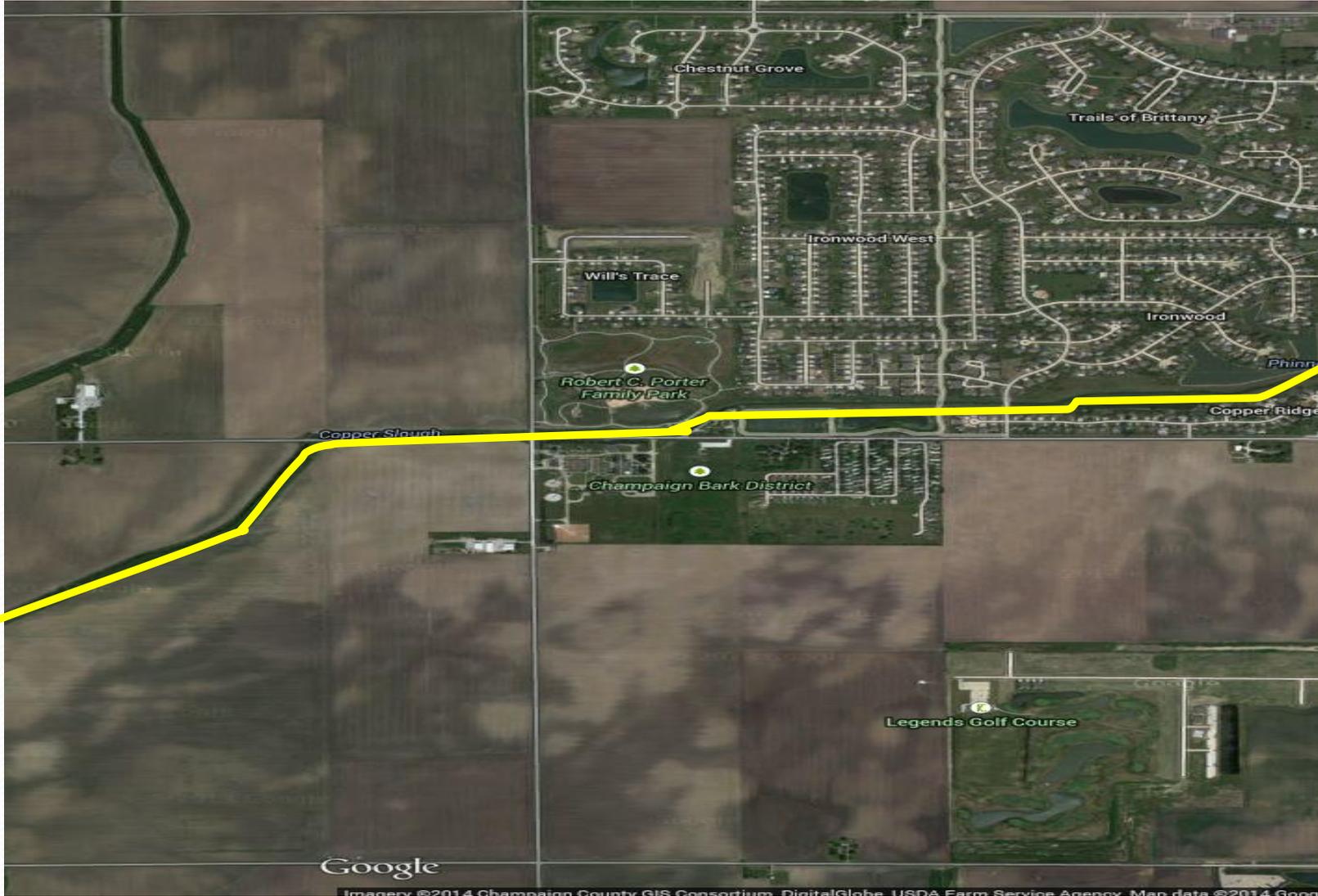
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# UCSD SW Plant

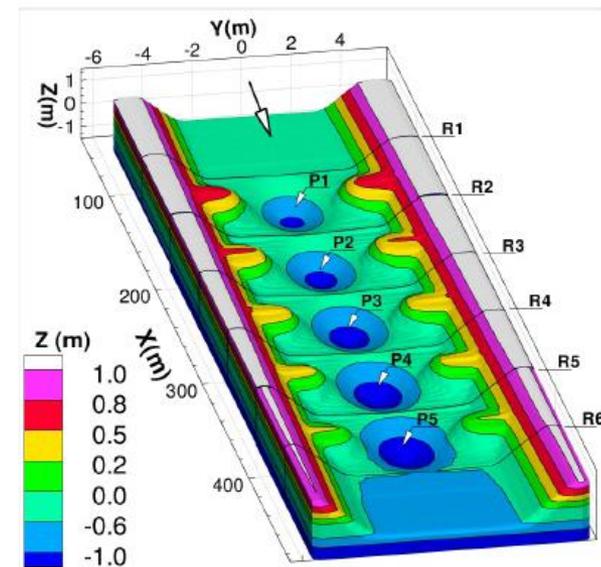
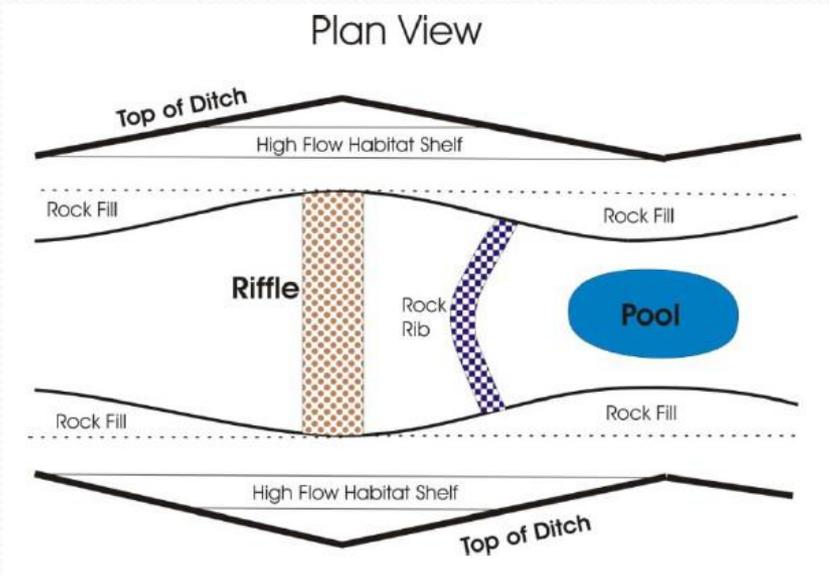


# UCSD SW Plant & Copper Slough

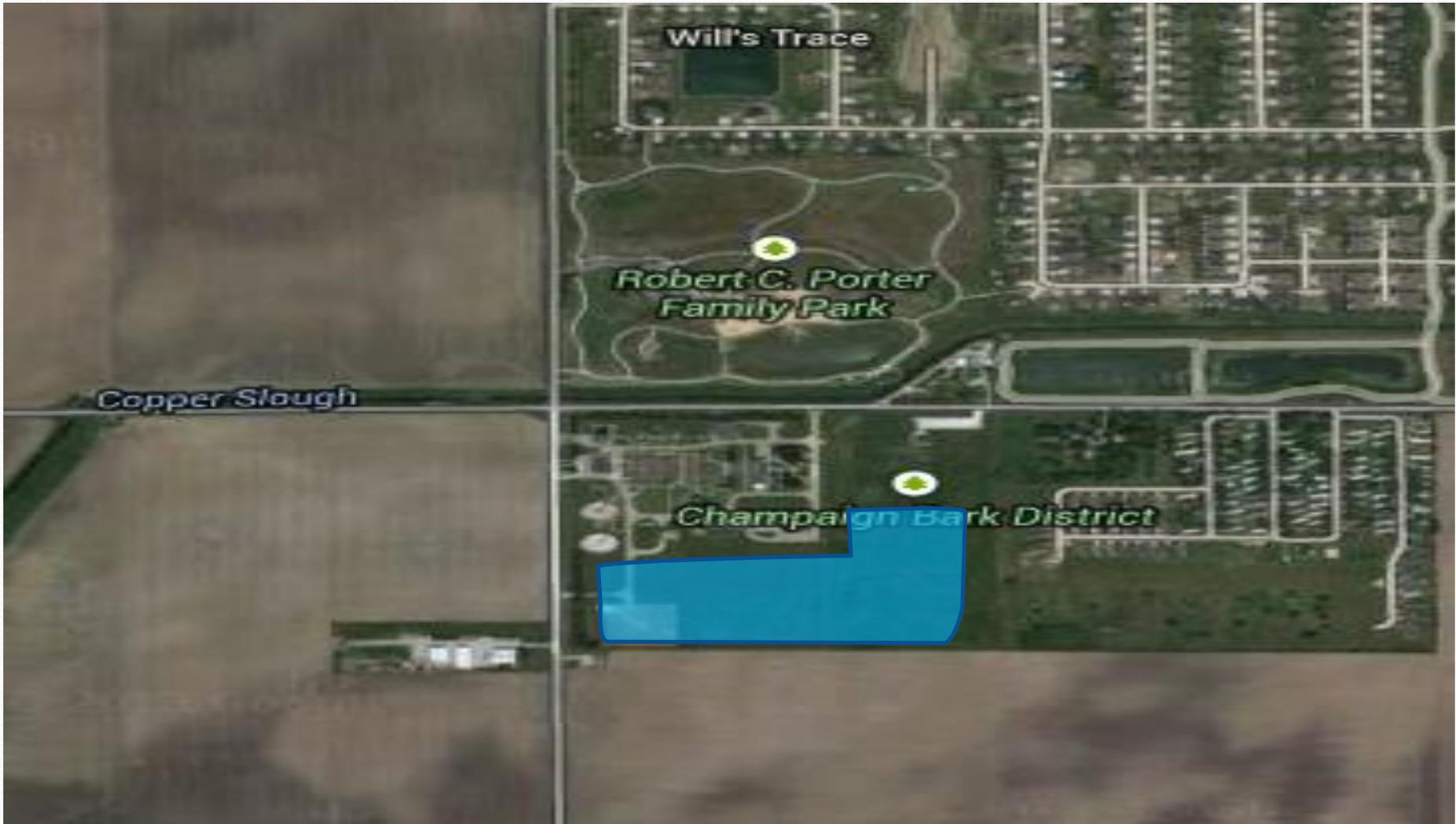


# Habitat Improvement

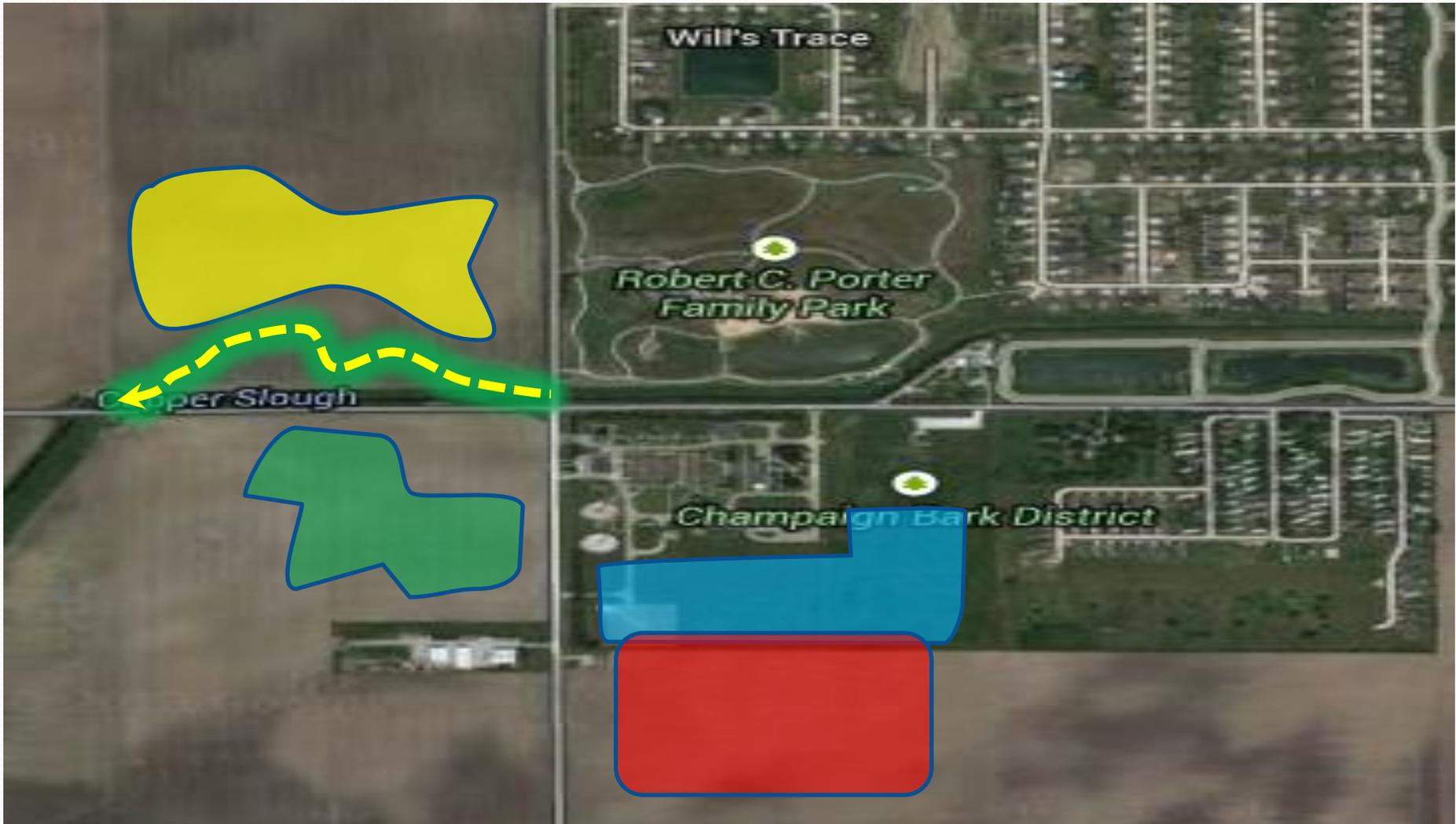
## Projects in Crystal Lake, Copper Slough Pool and Riffle Design



# Storage Lagoon Options



# Storage Lagoon Options



# Timeline

- First contact with UCSD in January 15, 2013
- Agreed to general contract terms in June 2013
- Agreed to specific contract in March 2014
- Cronus committed to building in Illinois in October 2014
- 3 year construction window; 1<sup>st</sup> sales expected in early 2019?
  - Waiting for bankers' financial commitment
    - and waiting...
      - and waiting...



# Lessons Learned

- **Simplicity in truisms. 1<sup>st</sup> job = Sanitary District.**
- **Drought sensitivity - avoiding zero discharge.**
  - Most people (and all fish) like having water in creeks.
  - But an obligation to discharge would be an obligation to pollute.
- **Statutes demonstrate public preferences.**
  - “What gives you the right to sell my sewage?” (*Sanitary District Act of 1917*)
  - “Is reuse a laudable goal?” (*YES! Congress & President agreed in 2014!*)
- **Money doesn't solve everything.**
  - Some people are really sick of utility easements.



# QUESTIONS ?



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