

**LAKE HODGES NATURAL TREATMENT SYSTEM PROJECT**



Photo courtesy wikipedia (LakeHodges15ByPhilKonstantin)

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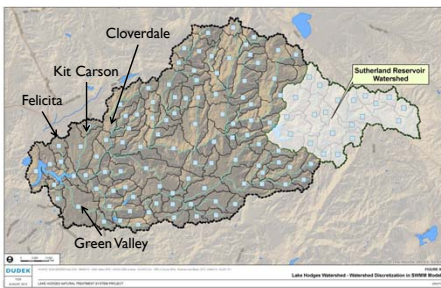
**LAKE HODGES NATURAL TREATMENT SYSTEM PROJECT**

- Model Development
  - Watershed
  - Land Use
  - Nutrients
  - SWMM
- NTS Alternatives
  - Distributed
  - Centralized (Option 1 – NTS-A and Option 2 – NTS-B)
- Hydrologic and Water Quality Analysis
  - 2.5-Year Storm Event (2010-2011 Wet Year)
  - Base Flow and Smaller Storm Events (2012-2013 Dry Year)

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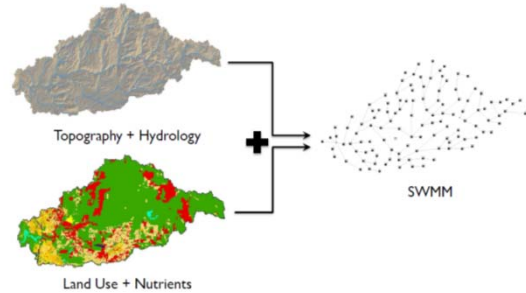
**LAKE HODGES WATERSHED (300 SQUARE MILES)**



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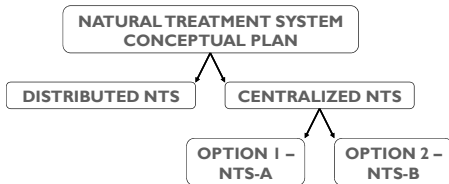
**STORM WATER MANAGEMENT MODEL (SWMM)**



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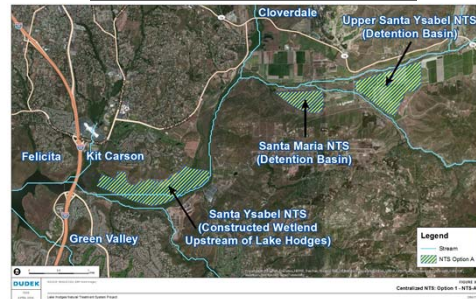
**NATURAL TREATMENT SYSTEM ALTERNATIVES**



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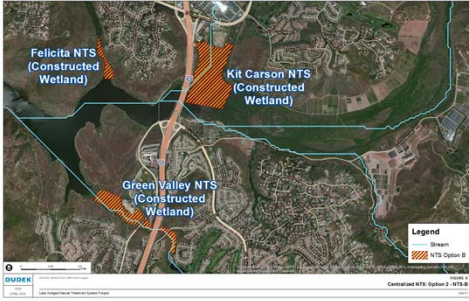
**CENTRALIZED NTS: OPTION 1 – NTS-A**



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**CENTRALIZED NTS: OPTION 2 – NTS-B**



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Evaluation Factors	Option 1 – NTS A	Option 2 – NTS B	Distributed NTS
Modeled Nutrient Load Reduction	High load reduction, but dependent on wet years.	High load reduction, but dependent on baseflow.	N/A
Construction Costs	Highest	Moderate	Lowest
O&M Costs	Likely similar to Option 2 (NTS B)	Likely similar to Option 1 (NTS A)	Significantly higher than Options 1 & 2
Land Availability	Mostly City of SD, PUD-owned	Mostly City of SD, PUD-owned	Dependent on private land & ROWs
Feasibility	Complex hydraulic engineering	Relatively simple – few sites, focused on low flows	High number of site, difficult to coordinate and implement
Storm Water Regulations/ Requirements/ Funding	Reduce need for nutrient TMDL, may get funding from MS4 Alt Compliance	Tribs not 303(d) listed for nutrients, may get funding from MS4 Alt Compliance	Likely to be implemented as MS4 compliance
Floodplain Modification/ Permitting	Potentially significant modification	Potentially requires in-line treatment	Minimal or none
Wetlands Regulations	Largest impact, moderate benefit	Moderate impact, largest benefit	Minimal impact and minimal benefit
MSCP Consistency	Need to seek exemption for structures	Need to seek exemption for structures	Likely outside of preserves
Agriculture	Largest impact	No impact	No impact



**RECOMMENDATIONS**

- Consider 85<sup>th</sup> percentile event for sizing centralized BMPs
- Locate/define baseflow within key reaches
- Potential partnership with SDSU on Lake Hodges Watershed Modeling- develop pollutographs/hydrographs and calibrate SWMM model



**PROJECT COSTS**

- Total project cost: \$182,540
- Total grant billed to date: \$97,000
- Local Match: \$85,540



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QUESTIONS??

