TAC Meeting – July 30, 2007
Announcements from the Chair

The focus of tonight's meeting was to have been for the TAC to finalize a unified summary of pros and cons based on what had been developed over the course of our deliberations on individual components of a wastewater system for Los Osos. Although each of the committees have put in a major effort to get this task completed in time for this meeting, I don't think we are yet at a point that we can get that finished this evening.

I would like to propose that we still follow our agenda with each committee reporting on what they have accomplished to date followed by a general discussion of those reports. To follow up on this meeting and try to keep our schedule for submission of our report, I would like to ask for a volunteer from each committee to meet with me tomorrow and finalize the pro/con summary. What we arrive at will be incorporated into the executive summary of our report that Karen and I will complete. The completed report will then be discussed and, hopefully, approved at our meeting next week.

Public comments and questions will be taken after the three committees have presented their reports and before the TAC begins its discussion. At that time only comments and questions pertaining to the Pro/Con reports will be allowed. I will call for all slips to be submitted before we begin. Once public comment begins, in order to keep our meeting on schedule, we will stop accepting new slips for that period so please get your slip in if you wish to speak.

If you have any other comment or question relating to the TAC and it role there will be a second public input period at the end of the meeting.

Questions to the Project Team will be answered as time permits at the end of the meeting. Please be sure and fill out Public Input slips and hand them in to a member of the project staff. If you wish to speak in both comment periods please submit two slips.

You may follow the progress of our pro/con analysis by visiting our website (http://www.slocounty.ca.gov/PW/LOWWP), select the TAC page and then the link to the working draft Pro/Con Analysis on Project Alternatives. This report has been updated to include any changes from the committees. We encourage your questions or comments on this report. Our e-mail address is LOWWP@co.slo.ca.us.

Presented by
Chairman Garfinkel
7/30/07

Los Osos Wastewater Project Technical Advisory Committee
Engineering Sub-Committee
Rough Screening Report Pro/Con Criteria

The San Luis Obispo County Board of Supervisors established the Los Osos Wastewater Project Technical Advisory Committee (TAC) for three primary reasons, which are: (1) to develop a Pro/Con analysis of the project alternatives developed by the County's Los Osos Wastewater Project Team, (2) to receive public input on the development of the Pro/Con analysis and (3) to make certain recommendations to the Board of Supervisors concerning the Pro/Con analysis. Although the function of the TAC includes reviewing all of the wastewater alternatives developed by the County Project Team, the scope of the TAC does not include making a recommendation for a specific project. Rather, the County elected to conduct a community-wide survey to obtain an understanding of the community's preferred wastewater project alternative. This community-wide survey will be conducted after the TAC Pro/Con Analysis is completed.

In accordance with the Bylaws of the TAC, the Pro/Con analysis was initiated through first developing a set of criteria, which would serve as the basis for the analysis. The criteria were developed as the TAC membership reviewed the report entitled Potential Viable Project Alternatives Rough Screening Analysis Report (Rough Screening Report), which outlined the various options for each of the five basic components of a wastewater project. The project components include: (1) effluent disposal, (2) wastewater treatment technology, (3) biosolids management, (4) wastewater treatment plant location, and (5) wastewater collection system.

The development of criteria proceeded through a series of properly noticed public TAC meetings. The TAC meetings included a presentation by the county covering a selected project component. The County presentation would be followed by public comment and full TAC discussion. Each subcommittee would subsequently conduct their own meetings to consider the information obtained from the Rough Screening Report, the County presentation and public comments, which were obtained from the public TAC meeting as well as through other forms of communication such as emails, letters and direct communication with TAC members. After consideration of the information, each subcommittee would develop a draft list of criteria and would present the criteria list to the full TAC at the following properly noticed public TAC meeting. Public comment and a full TAC discussion would follow each subcommittee presentation of draft criteria. A complete list of criteria was compiled for all five project components from each of the three TAC subcommittees.

In addition to the development of criteria for each project component, the full TAC membership also developed a set of core values. These core values would serve as an overall guide in preparing a Pro/Con analysis for specific project. The core values are as follows:

- Affordability
- Sustainability
- Flexibility
- Environmental Stewardship
- Community
- Controllability

Both the list of criteria for project components and the TAC core values were compiled prior to the release of the report entitled Viable Project Alternatives Fine Screening Report (Fine Screening Report). Once the Fine Screening report was released, the TAC began its Pro/Con Analysis in earnest with a component by component review. The criteria was applied and modified as appropriate to each project component. As an integral part of the analysis, each subcommittee would review the appropriate sections of the Fine Screening Report, conduct supplementary analysis, supplementary

Presented by
John Brady
7/30/07

research and inquiry from other information sources, prepare graphic displays as appropriate and review public input from the previous TAC meetings and other public correspondence. At each properly noticed public TAC meeting, the County would provide a brief overview of the selected project component and each subcommittee would subsequently provide a presentation outlining their work and analysis for the selected project component. Public comment and full TAC discussion would follow the County and subcommittee presentations.

As a result of the above described process, the TAC has produced the Pro/Con analysis which has included public input and also represents the consensus of the TAC. The analysis is presented in Appendix A. The meeting agenda is presented in Appendix B and the meeting minutes are presented in Appendix C. The project component criteria utilized in the engineering/water resources subcommittee analysis is presented below:

Effluent Disposal

- Level of control over disposal options, multi-faceted approach that does not depend on 3rd parties.
- Retain water in the basin for sustainability and increased yield/Seawater intrusion mitigation.
- Cost of various disposal options and energy consumption.

Wastewater Treatment Technology

- Flexibility of treatment process to meet future needs and regulations.
- Demonstrated reliability of process.
- Effect of process on bio-solids production.
- Cost consideration, replacement, operation and maintenance.
- Energy.

Bio-solids Management

- Maintain control and flexibility of disposal process.
- Nuisance assessment of bio-solids process and disposal.
- Cost of process facilities, operations and maintenance, and ultimate disposal.

Wastewater Treatment Plant Location

- Sufficient in size to meet environmental and potential future expansion needs.
- Minimize fluid transport costs.
- Minimize land costs, to include environmental mitigation costs.
- Site conditions with regards to constructability.

Wastewater Collection System

- Life cycle costs to include construction costs and operations/maintenance costs
- Construction Impacts
- Property impact for both private and public properties.
- Reliability of System.
- Environmental impact of system.
- Infiltration and inflow potential.
- Energy.

Environmental Working Group
Draft Final pro-con 7/30/07

CHAPTER 2 - EFFLUENT REUSE/DISPOSAL SYSTEMS

ENVIRONMENTAL

METHODS		PROS	CONS
Spray Fields [1]	Disposal Capacity (1,190 AFY)	Community owned asset	Cost to purchase land
	Saltwater Mitigation (0 AFY)	Tertiary treatment not required	Loss of water (no exchange/reuse)
	Energy Costs[3]	Denitrification not required	Seasonal
		Purveyor's cooperation not required	Salt loading in soils
		Future flexibility	Chlorination preferred
			Trenching for pipeline to spray fields (degree of impact dependent on treatment plant location)
			Unknown future regulatory requirements
Cemetery In Lieu	Disposal Capacity (50 AFY)	Minimal saltwater intrusion mitigation	Seasonal
	Saltwater Mitigation (5 AFY)	Purveyors' cooperation not required	Partial denitrification required
	Energy Costs[3]	If located adjacent to treatment plant minimal trenching impacts	Tertiary treatment required
			Unknown future regulatory requirements
Urban Reuse (Shallow Wells) [2]	Disposal Capacity (63 AFY)	Minimal saltwater intrusion mitigation	Seasonal
	Saltwater Mitigation (35 AFY)	No off-site trenching impacts	
	Energy Costs[3]	Purveyors' cooperation not required	
AG Reuse	Disposal Capacity (460 AFY)	Minimal saltwater intrusion mitigation	Seasonal
	Saltwater Mitigation (46 AFY)	Purveyors' cooperation not required	Partial denitrification required
	Energy Costs[3]		Tertiary treatment required
			Farmers' cooperation required
			Trenching for pipeline (degree of impact dependent on treatment plant location)
			Unknown future regulatory requirements
AG Exchange	Disposal Capacity (460 AFY)	Highest saltwater intrusion mitigation	Seasonal
	Saltwater Mitigation (250 AFY)		Partial denitrification required
	Energy Costs[3]		Tertiary treatment required
			Purveyors' cooperation required
			Farmers' cooperation required
			Trenching for pipeline (degree of impact dependent on treatment plant location)
			Unknown future regulatory requirements
Leachfields/Percolation Ponds (Broderson)	Disposal Capacity (448 AFY)	Significant saltwater intrusion mitigation	Full denitrification required
	Saltwater Mitigation (100 AFY)	Tertiary treatment not required	Construction impacts and costs from monitoring wells
	Energy Costs[3]	Purveyor participation not required[4]	Grading impacts on habitat (Initial construction and rehabilitation every 10 to 15 years)

Unknown future regulatory requirements

Footnotes:
[1] Undetermined natural habitats impacts and visual impacts.
[2] A purple pipe system was deemed to be infeasible because of significantly higher construction costs and environmental impacts and required cooperation by the purveyors without significant additional benefits.
[3] Detailed costs have been requested from the project team.
[4] Without harvest wells.

Comments:
Creek discharge and the use of injection wells should be considered in future analyses of effluent reuse/disposal systems. Future analyses must also recognize that achieving water balance across the entire water basin is not the sole responsibility of the wastewater project, but should be shared among all water users and purveyors within the basin.

Executive Summary:
Water balance must be achieved through the components selected to comprise the effluent reuse/disposal systems of the wastewater project. The individual components of that project can be chosen from the alternatives discussed in the report. It is clear that leach fields/percolation ponds at Broderson must be a part of any wastewater project in order to assure maximum recharge of the aquifer.

CHAPTER 3 - COLLECTION SYSTEM

CRITERIA	STEP/STEG	Gravity
ENVIRONMENTAL		
Construction disturbance	Excavation for new tank replacement est. @ 150 square feet	Excavation for installation
	Tank decommission est. @ 100 square feet	Tank decommission est. @ 100 square feet
	Higher on lot disturbances to residents	Street impact approximately 2 weeks for main installation
	Street impacts < significant; shallower & narrower trenches and increased potential for boring	Potential for 20+ feet excavation
Impact on biological resources	Dewatering less significant	Dewatering: the need to protect water quality with the disposal of collected water
Community impact	Permanent impacts Easements requires homeowner cooperation Manholes and controls in front yard of each home Ongoing pumping of tanks, approx. 5 per day; associated truck traffic and odor	Permanent impacts 20 Lift stations throughout the community Grinder pumps @ certain locations
	Pump on each tank	Truck traffic to plant
	Resident responsibility significant	Odor control @ lift stations
	Venting at high points of system< 200>500	
System failure risk	Homeowner responsibility significant	
	Effluent has less volume; with suspended solids in pressurized line	Effluent throughout system
Impact on archaeological resources	155 Square feet additional excavation	Increased volume of disturbance due to depth of pipe placement
	Assuming boring, less volume of disturbance	
Energy Kwh/year	500,000- energy required to convey 1.2 mgd to an out-of – town treatment facility	500,000- energy required to convey 1.4 mgd to an out-of – town treatment facility

Footnotes:
The environmental committee felt that the PRO/CON format was too limiting in bringing out a comprehensive comparison.

Comments:
STEP has greater on lot impacts short term and long term.
Cogeneration not possible with STEP collection
Gravity has greater construction impacts.

Executive Summary:
With STEP collection, the greatest concerns are with the short and long term on lot impacts: loss of landscaping, potential loss of community trees (Cypress and Pine throughout Baywood) as well as well established trees and bushes in easements.
The advantage of the STEP collection would be that the street impacts could be less due to smaller pipe and shallower trenching.

With gravity collection, the greatest concerns are associated with the impacts of construction: dewatering associated with the trenching and potential depth of pipe placement, street closures. The advantage of the gravity collection is less on lot impact and homeowner responsibility.

CHAPTER 4 - TREATMENT TECHNOLOGY

Oxidation Ditch

CRITERIA	PROS	CONS
ENVIRONMENTAL		
Construction Impacts		
Community Impact		
Biological Impact (1)		
Archeological Resources(1)		
Energy Use kWh/yr (2)	800,000 Step Collection	900,000 Gravity Collection

(1)Table 4.18
(2) All impacts are high and PRO/CON is based on the comparison of higher vs. lower

Biolac

CRITERIA	PROS	CONS
ENVIRONMENTAL		
Construction Impacts		With gravity - largest footprint of systems other than ponds
Community Impact		With gravity - size prohibits odor control
Biological Impact (1)		With gravity - size required for treatment technology
Archeological Resources(1)		With gravity - size required for treatment technology
Energy Use kWh/yr (2)	With STEP/STEG - 800,000	With gravity - 1,100,000

(1)Table 4.18
(2) All impacts are high and PRO/CON is based on the comparison of higher vs. lower

Partially Mixed Facultative Ponds

CRITERIA	PROS	CONS
ENVIRONMENTAL		
Construction Impacts		Earth moving
		Diesel
		Noise
		Dust
Community Impact		Primary treatment ponds are not a community amenity
Biological Impact (1)		Less energy but release methane gas which is a more powerful greenhouse gas than carbon dioxide
Archeological Resources(1)		Size required for treatment technology
Energy Use kWh/yr (2)	600,000 with both STEP or gravity	

(1)Table 4.18

MBR (Tri-W)

CRITERIA	PROS	CONS
ENVIRONMENTAL		
Construction Impacts		High Construction activity concentrated in town
Community Impact	Enclosed facility odor control	
Biological Impact (1)	Highest quality effluent	
Archeological Resources(1)		
Energy Use kWh/yr (2)	Requested information	Requested information

Footnotes:
(1)Table 4.18
(2) All impacts are high and PRO/CON is based on the comparison of higher vs. lower

Comments:
Facultative ponds have the largest footprint with least amount of biosolid but higher methane release
MBR has the highest quality of effluent leading to greater flexibility in disposal options but potentially has the highest energy consumption and cost

Executive Summary:
The environmental committee would like to clarify that facultative ponds are not a community amenity for recreation purposes whereas storage ponds or wetlands could be considered a community amenity due to accessibility. In addition, we have asked the project team to look at the flexibility of the TRIW project to other treatment technologies as well as MBR's consideration for other sites. The cost and energy use for MBR treatment should be compared with the technology and additional polishing steps necessary to reach the equivalent effluent quality. Disposal options will impact whether a higher level of treatment is necessary and whether cost is in the form of land or energy.

The environmental committee encourages the project team during the CEQA/NEPA process to provide further analysis of this entire project that includes an in depth look at all the aspects of carbon footprint and not be limited to energy consumption. The issue of chemical usage has been brought up on several occasions; the Draft Fine Screening report did not provide us enough information to do a PRO/CON on this issue but should be evaluated.

CHAPTER 5 - SOLID DISPOSAL SYSTEMS

ENVIRONMENTAL

CRITERIA		PROS	CONS
Volume	Sub-Class B		- Largest volume
			- Most expensive hauling costs
	Class B		- Largest volume
			- High hauling costs
	Composted Class A (all treatment alternatives)	+ Minimal volume	
		+ Minimal hauling cost	
	Faculatative Ponds	+ Reduced volume	
		+ Low hauling cost	
Class	Sub-Class B		- Worst quality
			- Most restrictive disposal options (Dependant on outside parties for disposal*)
			- Odor problems (Especially if solar drying is used)
	Class B		- Poor quality
			- Restrictive disposal options (Dependant on outside parties for disposal)
			- Odor problems
	Composted Class A (all treatment alternatives)	+ Best quality	- Least restrictive disposal options (Not dependent on outside parties for disposal)
		+ Least restrictive disposal options (Not dependant on outside parties for disposal)	
	Faculatative Ponds		- Unknown future disposal options (Dependant on outside parties for disposal)
Community impact	Sub-Class B	+ Least expensive construction cost	- Largest carbon footprint (High diesel consumption)
		+ Future flexibility	
		+ Relatively low annual O&M	
		+ Low acreage requirements	
	Class B	+ Moderate construction cost	- High carbon footprint (High diesel consumption)
		+ Future flexibility[1]	- Availability of adequate green waste for use as a compost bulking agent
		+ Moderate annual O&M	
		+ Low acreage requirements	
	Composted Class A (all treatment alternatives)	+ Least expensive construction cost	- Highest annual O&M
		+ Sustainability	- High acreage requirements
		+ Best regional solution	- Availability of adequate green waste for use as a compost bulking agent
	Faculatative Ponds	+ Least expensive construction costs	- High acreage requirements
		+ Lowest annual O&M	
		+ Moderate sustainability	
		+ Reduced carbon footprint (Low diesel consumption)	
		+ Minimal odor	
Traffic	Sub-Class B		- High wear and tear on road infrastructure from truck traffic
	Class B		

Footnotes:
[1] Flexibility for off-site recycling and disposal increases from Digested through Heat Dried to Composted Class B Biosolids.

Comments:
Regional Biosolid handling is the preferred long-term solution but is outside the scope of this analysis.

Executive Summary:
Composted Class A Biosolids is the preferred solution when looked at solely from impacts on the natural environment and should be the ultimate goal of any sewage treatment system. Faculatative ponds would appear to be the next most advantageous solution while the remaining solutions should be looked at only as short-term stopgap measures.

CHAPTER 6 - TREATMENT PLANT SITES

Common Pro-Con of the 'Cemetery Area' Sites		
Cemetery	22 useable acres (48 total) – contiguous with existing cemetery	
Giacomazzi	20 useable acres (37 total) – next parcel to the north	
Branin	15-25 useable acres (42 total) – farthest north, closest to Warden Lake wetland area	
CRITERIA	**PROS**	**CONS**
Construction impact	• Low population Density • Visual Screening • Construction Traffic out of town	• Some Soil Erosion Potential • Proximity to Community Cemetery (Proximity greatest at Cemetery site) • Trenching to and from town
Community impact	• Low population Density • Natural Screening	• Proximity to Community Cemetery • Future Cemetery expansion could increase proximity
Impact on biological resources	• Minimal habitat value on site – some small areas of Sensitive Resources	• Trenching to and from town, including crossing Los Osos Creek • Proximity to Warden Lake (Branin> Giacomazzi> Cemetery)
System failure risk	• Site area adequate for on-site containment (Branin may be small, depends on treatment technology footprint)	• Proximity to Warden Lake (Branin> Giacomazzi> Cemetery)
Impact on archaeological resources		• Limited information available: previously identified sites on portions of Cemetery and Branin • Trenching to and from town
Energy Use	• Site areas generally large enough to provide potential for alternative energy options	• Energy requirements for pumping sewage out of town and effluent back in.
Land use plans and policies	Compatible	
Agriculture Land Use		Loss of Ag Land (Class III – not highly productive)

Tri-W Site

CRITERIA	PROS	CONS
Construction impact		• High population density (Noise, dust…) • Downtown traffic
Community impact	• Resource park (if still included)	• High population density (noise, odor) • Partial visual obstruction of Morro Rock
Impact on biological resources	• Site Graded & conditions mitigated • No creek crossing for wastewater	• ESHA – Sensitive Dune Habitat
System failure risk		• Proximity to Estuary • Site size makes on-site containment more difficult
Impact on archaeological	• Tribal agreements in place • Resources largely known (due to initial work	

resources	on site)	
Energy Use	• Less pumping of wastewater and effluent	• Less potential for alternative energy (Site size limitation)
Land use plans and policies	• Compatible	• Inconsistent with LO vision statement
Agriculture Land Use	• Non-Ag	

Executive Summary:
The Cemetery Area sites are largely similar. Compared with Tri-W, they greatly reduce the proximity of the plant to the community, and the larger site sizes provide greater flexibility in treatment and biosolid approaches. Trenching, creek crossing, and energy requirements for pumping wastewater out of town and effluent back are downsides to out of town sites. The Draft Fine Screening Report has functionally limited this analysis to two options. The Environmental Working Group recommends that future analyses (CEQA/NEPA) include a closer look at some of the sites that were screened out between the rough and draft fine reports.

Chapter 7- Summary of Viable Project Alternatives

Key issues from Ch 7:

Tri W – Consideration of the Tri-W alternative should include some discussion of what aspects of that project have flexibility to be modified from the original design and which do not. For instance the full range of effluent disposal options appear to be applicable to a plant located at Tri-W and may in fact benefit from the high quality of effluent produced by MBR treatment. Biosolids options may be more limited by available site area and greater community impacts from odors at this location. The cost impacts of the feasible range of options at Tri-W should be considered and presented in the Final Fine Screening Report

Biosolids Hauling of Subclass B Biosolids is carried through all alternatives in Chapter 7. This is the least preferred biosolids option from the Environmental Working Group's perspective. Composting and re-using this resource locally is a more sustainable option that is not dependent on outside receivers nor trucking costs. If Subclass B hauling is carried through due to financial considerations, the potential for future additional treatment should be maintained (i.e. site space).

Section 7.3.3 Litigation and Permitting (including mitigation and restoration)

The Tri-W project appears to have a significant advantage in this area with most permits and mitigation in hand and most potential litigation already resolved. Permitting other viable projects is entirely feasible, but will require additional time relative to Tri-W, and provide opportunities for appeals and litigation that will result in more time and cost.

Project delays have multiple negative impacts:

- The current pollution of the upper aquifer and estuary continues,
- Sea water intrusion continues (some measures to address this can and should be implemented separate from the Wastewater Project.)
- Regulatory pressure intensifies (although the Water Board has in the past recognized that litigation and permitting are largely out of the control of the party working to implement a project).
- Increased costs. These costs are difficult to estimate but include inflation in materials and labor, difficulty obtaining grant funding for projects in litigation, higher bids on projects in litigation, and the cost of litigation and permitting itself.

Water Balance, Figure 7.4 – Level 2 costs no more than Level 1, and should therefore be the 'base project'. Level 3 Sea Water Intrusion Mitigation achieves groundwater balance at current population while level 2 only gets us halfway there. Level 3 is needed, and the additional cost to achieve it (estimated at ~$15 M in the report) should be shared among all water users, tiered to water use, and compared to the cost to import the equivalent water from outside the basin.

Purveyor cooperation is an integral component of solving this problem and should be included in the analysis to the extent reasonable estimates of effectiveness and costs are available.

LOS OSOS WASTEWATER PROJECT TECHNICAL ADVISORY COMMITTEE

San Luis Obispo County Department of Public Works

TAC

EXECUTIVE SUMMARY OF PRO/CON ANAYLSIS

Draft 7/30/07

COLLECTION	PROS	CONS
Gravity	Lower annual O&M costs for collection ($450k/yr)	Higher capital costs ($69.4M - $77.7M)
	Lower on-lot costs included in project assessment	Longer time to construct (2 years)
	No access required on private property	Impact on treatment costs (higher capital costs, + $3M; and annual O&M, +$120k-$150k)
		Impact on solids treatment and disposal (higher capital costs, +$1.2M; and annual O&M, +$325k)
		Higher risk of raw sewage spilling into Bay in event of system failure
		Increased risk of I/I over time; may require additional cost of monitoring/ repair program
		Greater road impacts, requiring deeper trenching and dewatering, resulting in significant soil erosion, traffic nuisance
		Higher risk of impacts on archeological resources may result in delays, additional cost
		Pump stations require additional footprints (20 stations, 7 of which will have 14'x28' building, 15 feet high)
		Higher on-lot costs paid by individual homeowners
		Higher energy usage with Low Pressure
STEP/STEG	Lower capital costs ($59.4M - $75.3M)	Higher annual O&M costs for collection ($745k/yr)
	Shorter time to construct (9 months)	May require additional nitrification treatment for disposal options
	Provides primary treatment in septic tank, thereby reducing down-line costs for treatment system and solids treatment/ disposal	If SRF loan is used, may require separate electrical connection premium
	Reduces risk of raw sewage spilling into Bay	Loss of land use on individual property (8'x13' underground, with 2' diameter hatch visible)
	Horizontal Directional Drilling (HDD) and/or shallow trenching results in less road impacts and traffic nuisance, less risk to archeological resources and associated delays	
	Requires no lift stations, reducing footprint requirements	
	Minimal risk of I/I and resulting impact on Load	
	Lower on-lot costs paid by individual homeowners	

LOS OSOS WASTEWATER PROJECT TECHNICAL ADVISORY COMMITTEE

San Luis Obispo County Department of Public Works

TAC

TREATMENT	PROS	CONS
Oxidation Ditch	Small footprint (8 acres)	Higher capital costs than BIOLAC ($16M - $19M)
	+/- Lower annual O&M with STEP ($570k/yr); Higher with Gravity ($690k/yr)	+/- Lower annual O&M with STEP ($570k/yr); Higher with Gravity ($690k/yr)
BIOLAC	Lower capital costs than Ox Ditch ($13.7M-$16.4M)	+/- Lower annual O&M with STEP ($550k/yr); Higher with Gravity ($700k/yr)
	Small footprint (8-10 acres)	
	+/- Lower annual O&M with STEP ($550k/yr); Higher with Gravity ($700k/yr)	
Ponds	Lowest capital costs ($13.1M - $14.2M)	Requires larger footprint (16-20 acres)
	Lowest annual O&M ($510k/yr)	May require additional nitrification treatment
	Lowest energy usage (600,000 kWh/yr)	Higher risk of odors
	Eliminates cost of solids treatment	
	Reduces cost and related nuisance of sludge disposal (dredging required once every 20 years)	
MBR	Requires smallest footprint (4 acres)	Extremely high capital cost ($55M)
	Higher quality of effluent, suitable for discharge at Broderson leach field	Highest energy usage (1.3M kWh/yr. EIR indicated 2.1M and expected to increase with time)
	Enclosed facility controls odors	Higher annual O&M ($700,000)

BIO-SOLIDS	PROS	CONS
Sub Class B	Lowest capital cost for treatment (Gravity $1.9M; STEP $1.1M)	Produces greatest volume of sludge (4,056 tons/yr for Gravity; 1,014 tons/yr for STEP)
	Low annual O&M (Gravity $430k+; STEP $187k+)	Most restrictive disposal option
	Flexibility to be upgraded	Highest hauling costs and traffic nuisance in center of town
		Produces lowest quality of sludge; may require additional treatment for disposal
		Risk of substantial increase in hauling costs and more stringent regulations
Digested and/or Heat Dried Class B NOTE: Heat –dried process is typically used to produce Class A biosolids. Since it has higher capital costs and O&M, it has been eliminated in this comparison.	Produces lower volume of sludge	Higher capital cost for treatment (Gravity $2.3M; STEP $1.2M)
	Lower hauling costs and traffic nuisance	Higher annual O&M (Gravity $420k+; STEP $220k+)
	Greater flexibility for more disposal options	

Composted Class A	Produces lower volume of biosolids (1,327 tons/yr for Gravity; 332 tons/yr for STEP)	Higher capital costs (Gravity $3.5M+; STEP $2.0M+)
	Produces highest quality of biosolids with greatest range of disposal options	Higher annual O&M (Gravity $400k; STEP $230k)
	Potential to generate revenue	Requires adequate user demand
Facultative Ponds	Requires no ongoing sludge treatment or disposal. Ponds would be dredged approximately every 20 years, with amortized costs of $30k- $50k per year.	

SITING	PROS	CONS
Cemetery	Adjacent to Giacomazzi: Potential of northern acreage for alternative energy, future expansion, upgrades	Inadequate footprint to accommodate entire treatment facility
	Proximity to spray fields and ag reuse reduces cost of piping	Questionable willingness of seller
		Proximity to funeral events, visitors
Giacomazzi	Sufficient acreage to build treatment facility	Increased cost to pipe influent from collection area
	Flexibility for alternative energy, future expansion, upgrades	Distance from potential Broderson leach field
	Screened from LOVR	
	Low population density	
	Willing seller	
	Community acceptance of out-of-town site	
	Proximity to spray fields and ag reuse	
Branin	Adjacent to Giacomazzi: Potential for wetland storage, alternative energy, future expansion, upgrades	Inadequate footprint to accommodate entire treatment facility
	Proximity to spray fields and ag reuse	
Tri-W	Already owned by CSD	Very high land value and mitigation requirements
	Site of project already mitigated, therefore may shorten construction time	Small acreage in downtown locations requires most expensive treatment and higher costs overall
	Central location reduces cost of collection system	Lacks flexibility for future expansion, upgrades, or alternative energy
	Proximity to potential Broderson leach fields	High risk associated with system failure due to proximity to Bay
		Lacks community acceptance due to proximity to church, library, community center, and traffic impacts
		Greatest distance to spray fields and ag reuse
		NOTE: It was the unanimous opinion of the NWRI that an out of town site is better due to problematic issues with the downtown site.

LOS OSOS WASTEWATER PROJECT TECHNICAL ADVISORY COMMITTEE

San Luis Obispo County Department of Public Works

TAC

DISPOSAL	PROS	CONS
Spray Fields* **Cost per AFY mitigated: up to $12.2M** *If water is disposed of outside the basin, a more cost-effective option may be for ag reuse to the east.	Greatest capacity (up to 1190 AFY); potential back-up plan if participation is not procured for other disposal options	Zero Seawater Intrusion Mitigation
	Lower treatment requirements (tertiary and denitrification treatment probably not required)	Negative impact on groundwater balance; all disposal on spray fields is lost to groundwater basin
		Greatest footprint and highest land costs (up to 270 acres, totaling up to $ 7M)
		Highest capital costs for pipe to fields ($5.2M) and higher risks for trenching *
Cemetery Reuse **Cost per AFY mitigated: Negligible**	Proximity to Giacomazzi site reduces pipe costs	Limited capacity (50 AFY)
		Very low Mitigation factor (.1) = 5 AFY mitigation
Agricultural Reuse* **Cost per AFY mitigated: $1,950**	Potentially reduces pumping large volumes from aquifer (up to 460 AFY)	Very low Mitigation factor (.1) = maximum 46 AFY mitigation
	Proximity to Giacomazzi site reduces pipe costs	Slow ramp-up time to obtain contracts
	Flexibility to upgrade to Ag Exchange*	
Broderson* **Cost per AFY mitigated: $68,000**	Moderate capacity (448 AFY without Harvest Wells)	High capital costs ($6.8M without wells)
	Moderate SWI Mitigation factor (.22) = 100 AFY mitigation	Distance from Giacomazzi site increases pipe costs ($4.4M)
	Tertiary treatment not required	Lack of community acceptance
		Large footprint and high land value ($4.7M)
		High risk of more stringent DHS regulations in future (Total Organic Carbon concentration, and travel time/ distance to nearest production well) NWRI: If Broderson is used, it is important to evaluate compliance with new DHS Groundwater Recharge Reuse criteria.
		EIR: Broderson is subject to landsliding once disturbed, due to sandy soils and 10% slope at southern portion of northern 40 acres
		EIR: Leach field trenches pose significant risk of liquefaction
		Questionable efficacy (Sheikh: "Ability to mitigate SWI is not tested, modeled or calculated." Clay lenses will tend to move water horizontally, not vertically.
		Higher capacity requires harvest wells, incurring additional capital costs, annual O&M, and purveyor participation
		Requires complete reconstruction every 10 years

*The Finance Group recognizes the importance of mitigating Seawater Intrusion, but believes that associated costs should be paid for by the entire groundwater basin community.

EIR (page 168): "Current modeling results suggest that, so long as 230,000 gpd of treated wastewater is disposed of *east* of the fault, groundwater levels and SWI are expected to remain stable." A site at the east end of El Moro Avenue was considered.

COLLECTION COST COMPARISON

Draft 6/21/07

	Gravity	STEP/ STEG
Total Construction and Homeowner Costs (1) (2)	**$80.3M - $89.7M**	**$64.8M - $81.2M** (3)
Annual Operations & Maintenance Costs	**$450,000** (4)	**$745,000** (4)

(1) Not including separate electrical premium.
(2) Homeowners' on-lot costs are not part of gravity collection project costs, but are included here for comparison purposes only.
(3) Additional research is required to determine if STEP costs for overhead, profit and taxes are already included. If so, the total construction costs would be lower by $10.6M to $13.2M.
(4) STEP's septic hauling costs ($150k) are included here. Gravity's hauling costs are included in Bio-solids, Sub Class B costs.

TREATMENT COST COMPARISON

Draft 6/15/07

Treatment Technology	Total Capital Costs Level 2 Treatment		Annual O&M Level 2 Treatment		Energy Requirements (Kilowatt hours/ year)		Acerage Required	
	Gravity	STEP	Gravity	STEP	Gravity	STEP	Gravity	STEP
Oxidation Ditches	$22.6M	$21.7M	$720,000-$790,000	$60,000-$760,000	900,000	800,000	8	8
BIOLAC	$19.9M	$19.4M	$730,000-$800,000	$670,000-$740,000	1,100,000	800,000	10	8
Facultative Ponds	$22.8M	$21.7M	$695,000-$765,000	$695,000-$765,000	600,000	600,000	20 (4)	20 (4)
MBR – Tri-W	$55.0M	NA	$700,000	NA	***Numbers needed***	NA	4	NA

Assumptions:
(1) Denitrification needed for 0.8 MGD side stream at peak winter flow.
(2) Full 1.4M flow treated to tertiary level for agriculture, urban reuse, and future regulations.

NOTE: Report uses 1.4mgd in all final cost calculations. STEP costs should be recalculated based on 1.2mgd.

BIO-SOLIDS Alternatives	Capital Costs		Annual O&M		Biosolids Produced Tons/ year		Acres Required for Solar Drying	
	Gravity	STEP	Gravity	STEP	Gravity	STEP	Gravity	STEP
Sub Class B	$1.9M - $2.4M	$1.1M - $1.7M	$430k - $470k	$190k - $270k	4,056	1,014	5.7	1.4
Digested Class B	$4.2M - $4.7M	$2.4M - $3.4M	$420k - $460k	$220k - $310k	3,103	776	4.4	1.1
Heat Dried B	$5.4M - $6.2M	$3.1M - $4.8M	$600k - $640k	$340k - $480k	1,043	261		
Composted Class A	$3.4M - $4.2M	$2.0M - $3.3M	$600k - $635k	$350k - $505k				
Facultative Ponds	-0-	-0-	$ 40k - $ 50k	$ 30k - $ 40k	(1)	(1)		

(1) Biosolids will be dredged and hauled approximately every 20 years. STEP produces approximately 80% less solids than Gravity.

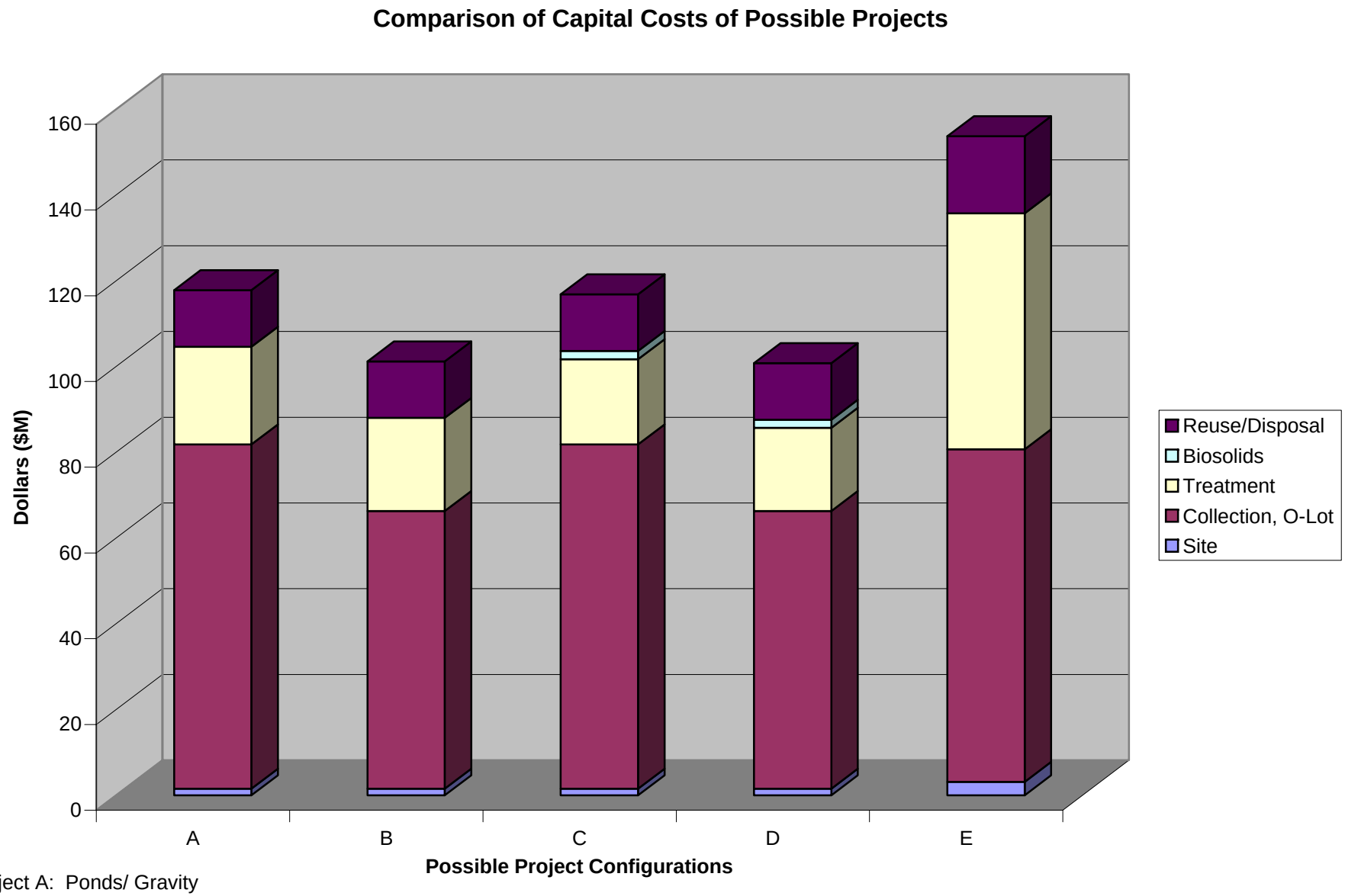
Presented by Karen Venditti 7/30/07

COST/ BENEFIT ANALYSIS OF EFFLUENT REUSE/ DISPOSAL ALTERNATIVES

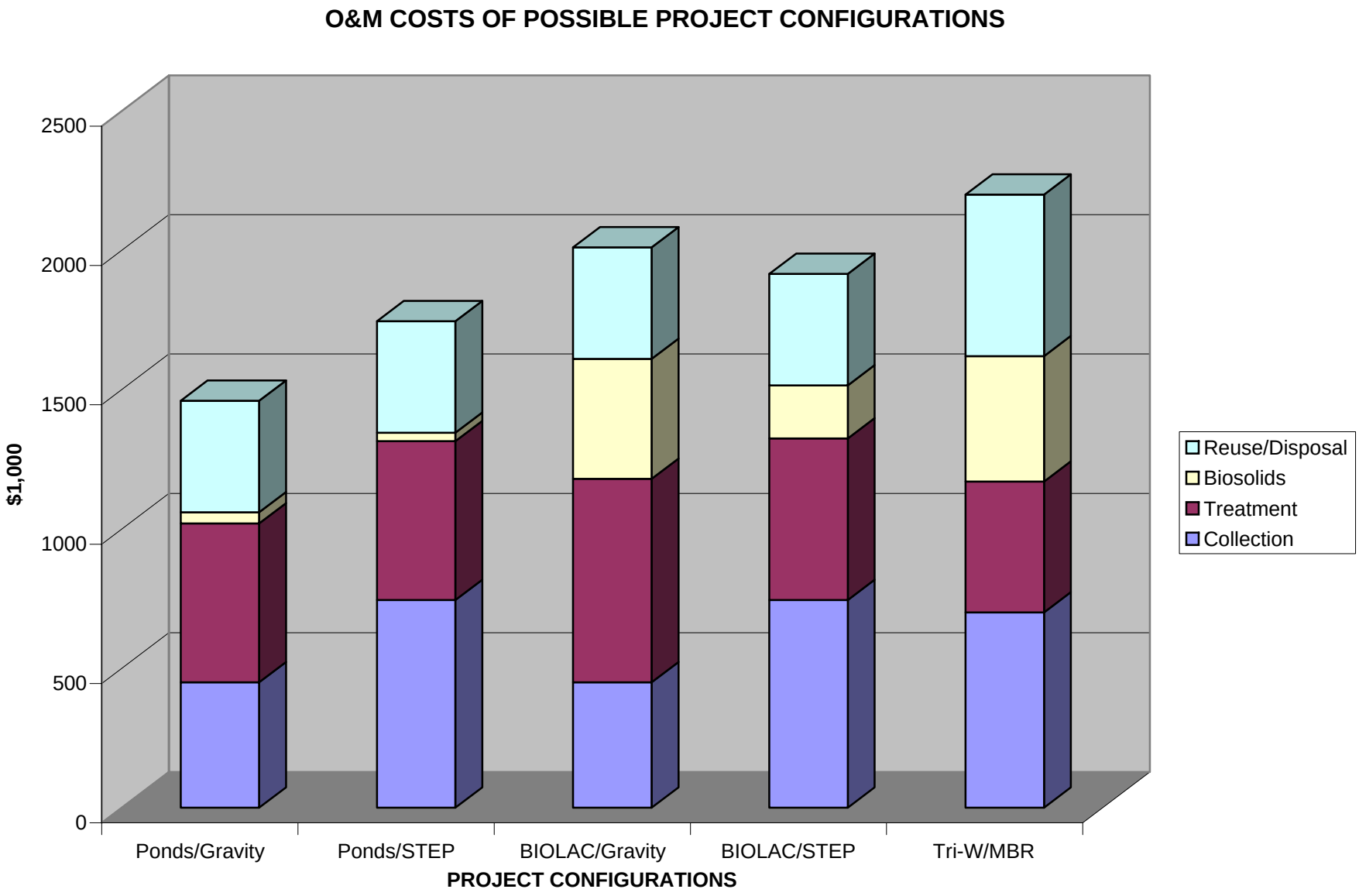
Draft 7/12/07

Reuse/Disposal Level	Capital Costs	Annual O&M Costs	Land (Spray field)	Storage	Seawater Intrusion Mitigation
Level 1a: Full Ag Reuse	$12.7M - $14.3M	$100k - $190k	170 acres = $5.1M	290 AF	140 AFY
Level 1b: No Ag Reuse	$12.8M - $15.6M	$125k - $275k	280 acres = $8.4M	210 AF	90 AFY
Level 2a: Full Ag Reuse	$13.2M - $13.9M	$400k - $440k	70 acres = $2.1M	140 AF	240 AFY
Level 2b: No Ag Reuse	$14.9M - $16.7M	$440k - $530k	180 acres = $5.4M	30 AF	190 AFY
Level 3a: With Full Ag Use and Broderson	$25.6M - $27.3M	< $400k (1)	10 acres = $0.4M	115 AF	

(1) According to County staff, the O&M number in the Fine Screen needs to be revised downward.



Project A: Ponds/ Gravity
Project B: Ponds/ STEP
Project C: BIOLAC/ Gravity
Project D: BIOLAC/ STEP
Project E: Tri-W/ MBR


O&M COSTS OF POSSIBLE PROJECT CONFIGURATIONS
$1,000
2500
2000
1500
1000
500
0
Ponds/Gravity
Ponds/STEP
BIOLAC/Gravity
BIOLAC/STEP
Tri-W/MBR
PROJECT CONFIGURATIONS
Reuse/Disposal
Biosolids
Treatment
Collection

COST COMPARISON OF VIABLE PROJECT ALTERNATIVES
FOR ILLUSTRATIVE PURPOSES ONLY

TAC Finance Group Draft 7/27/07

Project/ Mitigation	Siting	Collection and On-Lot costs	Treatment	Biosolids	Reuse/ Disposal (2)	Total Capital Costs	Annual O&M
A **140 AFY**	**Giacomazzi** $1.5M	**Gravity** (1) $80.3M - $89.7M	**Ponds** $22.8M	**Sub-Class B** - 0 -	**Level 2a**: $13.2M - $13.9M	**$118M - $128M**	**$1.5M - $1.6M**
B **140 AFY**	**Giacomazzi** $1.5M	**STEP/ STEG** (3) $64.8M - $81.2M	**Ponds** $21.7M	**Sub-Class B** - 0 -	**Level 2a:** $13.2M - $13.9M	**$101M - $118M**	**$1.7M - $1.9M**
C **140 AFY**	**Giacomazzi** $1.5M	**Gravity** $80.3M - $89.7M	**BIOLAC** $19.9M	**Sub-Class B** $1.9M - $2.4M	**Level 2a** $13.2M - $13.9M	**$117M - $127M**	**$2.0M - $2.2M**
D **140 AFY**	**Giacomazzi** $1.5M	**STEP/ STEG** (3) $64.8M - $81.2M	**BIOLAC** $19.4M (4)	**Sub-Class B** $1.9M - $2.4M	**Level 2a** $13.2M - $13.9M	**$101M - $118M**	**$1.9M - $2.1M**
E **190 AFY**	**Tri-W** Value $3.1M	**Gravity** $77.6M - $85.6M	**MBR** $55.0M	**Sub-Class B** Included	**Level 2b** $18.0-$20.0M (6)	**$153.7M-$163.7M** (5) (6)	**$2.2M - $2.4M**

(1) On-lot costs for Gravity collection system will not be included in project costs, as they are paid by property owners.
(2) **Level 2a** effluent reuse/ disposal utilizes spray fields, agricultural and cemetery reuse, conservation, and storage.
(3) Ripley's 2006 Update indicates STEP/ STEG collection costs of $56.4M – a difference of $8.4M to $24.8M from the Fine Screen.
(4) Includes Nitrification/ Denitrification and Tertiary treatments.
(5) Based on MWH reports, Ripley's 2006 Update indicates the total capital costs for the Tri-W system will be $201.6M – a difference of $37.9M to $47.9M from the Fine Screen
(6) Based on Table 7.4, these costs will increase 24.5% with the addition of project costs.

COST TO UPGRADE to Composted Class A Biosolids	**Gravity**	**STEP**
Capital costs	$1.5M - $1.8M	$0.9M - $1.6M
Annual O&M	$170,000	$160,000

* The Financial Working Group unanimously agrees that we want to achieve the highest level of Seawater Intrusion Mitigation and Groundwater Balance. However, we believe that associated costs should *not* be borne alone by property owners in the Prohibition Zone. Costs relating to mitigation options should be paid for through a separate assessment for everyone in the basin..