MEMORANDUM

Heritage Ranch CSD
5-Year CIP

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CIVIL AND TRANSPORTATION ENGINEERING
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WATER RESOURCES

Date: February 5, 2017

To: John D'Ornellas

From: Steven G. Tanaka

Subject: 5-Year CIP for Water and Sewer

As part of the District's current water and sewer rate study being conducted by Tuckfield Associates, a 5-year capital improvement program (CIP) needs to be prepared to be incorporated into the rate study. It is customary to develop and project key CIPs anticipated to occur during this 5-year time period, as these overall costs must be incorporated in to the water and sewer rate structure. Typically rate studies do not project too far beyond the 5-year time frame.

Overall CIP Considerations

Each Capital Improvement Project may have varying cost components and schedule considerations. This 5-Year CIP will project expected timelines for when expenditures will occur, within the 5-year timeline. Timelines may also be projected beyond to the 5-year window to provide the Board with an overall understanding of project duration and timeline. Expenditures that will occur beyond the 5-year timeframe may be projected during the next 5-year CIP/rate study to be conducted in subsequent years.

"Soft" Costs versus "Hard" Costs.

"Soft" costs are defined as planning, environmental, engineering and administrative costs that are all necessary components of public improvement projects. "Hard" costs are the actual construction and equipment purchase costs associated with the Project. The soft costs are sometimes overlooked, but are significant components of CIP overall project costs. Examples of soft costs include:

- Administrative Costs/District staff time. Some projects, especially those that may be funded by State or Federal monies, can often require considerable staff time and effort to administer projects to comply with financing agency requirements.
- Environmental review. All projects require compliance with the California Environmental Quality Act (CEQA). The environmental review required varies considerably, depending on the size and complexity of the Project, if the Project is new or "grass roots" compared to modification or upgrade to an existing facility, environmentally sensitive resources including plants and animal species, and other factors. The costs associated with environmental review can sometimes be difficult to ascertain. Simple public improvement projects, such as a water main replacement/upgrade, generally are exempt

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from CEQA, where environmental review for projects such as the new Headworks at the WWTP could be considerably more complex and costly, and will depend heavily on the extent that construction may extend to "untouched" land immediately north of the treatment ponds.

- Planning. Depending on the nature of the Project, planning activities may be required. This can be as basic as general planning and logistical considerations for the Project, to detailed review of a Project relative to County land use and zoning requirements and securing a conditional use permit (CUP). In general, however, special district water and sewer facilities including building and grading activities are exempt from County jurisdiction and permits.
- Survey and Geotechnical Work. Some projects require survey and/or geotechnical work, depending on the nature of the project and the need for structural foundation work. For example the new Headworks will require a survey to develop a detailed site plan. This is necessary to prepare engineering plans suitable for public bidding. Geotechnical work will also be required, as new facilities will require structural concrete, foundations must be adequately designed to support equipment loads, and equipment must be adequately secured and protected against seismic movement.
- Engineering. Certain projects require engineering work to design facilities, such as pipelines, pump stations, treatment facilities, etc. Many public improvement projects require that plans be designed and stamped by a professional civil engineer licensed in the State of California.
- Public Bidding. Publicly funded projects of $25,000 value and greater must be bid in accordance with State Contracting laws. Publicly bid projects have numerous requirements including prevailing wages, performance and payment bonds, public bid openings, bid evaluation, and other requirements. The District Engineer typically assists the District with the various public bid requirements.
- Construction Management/Administration. Depending on the nature, magnitude and complexity of the Project, construction management and administration support is needed. Activities may include administering the construction contract, progress payments, daily reports and inspections, coordination with specialty inspections such as soils testing, periodic site visits to assess general conformance with contract requirements, submittal reviews, responding to requests for information (RFIs), developing punchlist, filing notice of completion, and numerous other functions. A third party engineering firm can provide CM services, and many times the same engineering company as the engineer of record (EOR) provides such services.

Soft costs are generally developed based on engineering judgment, cost data collected from experience and comparison of similar work in the Central Coast area, consultation with vendors and contractors, established budgetary unit prices for the work, and other reliable sources. Soft costs are budgeted for based on taking the hard construction costs and escalating by a factor of 1.4 or 40%. This percentage can be adjusted based on the nature of the Project, to include environmental, preliminary engineering, engineering, administration, construction management and inspection costs.

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Financing and Funding Options

Certain CIP projects may be substantial enough to warrant financing. Similar to the recently completed Wastewater Master Plan and Recycled Water Study, there may be opportunities for both grant and loan options. Some potential opportunities for funding may include, but not be limited to:

1. State Revolving Funds (SRF) program (likely funding source for WWTP improvements).
2. State Prop 1 grants.
3. USDA/RUS grant and loans.

Cost Basis

CIPs are generally expressed in "current" dollars, based on the Engineering News Record (ENR) Cost Index. This is an established cost index indicative of the value of the dollar in the current month/year indicated. Currently, the most recent ENR Construction Cost Index is 1**0530** (December 2016, latest available at time of this Report). In future years, in order to project costs in the current year, the ratio of current ENR Index divided by prior ENR Index, is multiplied by the historic cost to project future costs. For example, let's assume the Year 2010 ENR Index for a Project was **10000**, and the Engineer's Opinion of Probable Cost for the Project was estimated at $250,000 in Year 2010. The current value of the Project would be calculated as follows: 10530/10000 x $250,000 = $263,250.

For a 5-year CIP projection, the term of 5 years is relatively short, and the adjustment of capital costs during this time frame using an ENR Index or other tools is not as critical as when planning over a 20 year planning period (such as a master plan). However, should economic changes be significant during the time period, certainly the ENR Index should be applied. The rate consultant may have other means of adjusting costs as part of the Rate Study.

Cost Allocations to Future Growth

Some of the capital improvement projects are required in part to serve future growth, while other CIPs are mostly to serve existing customer needs. The District Engineer should work closely with the rate consultant and General Manager to determine to what extent capital expenditures/projects should be paid for by future development. The distinction is that for an existing water or sewer facility that requires an upgrade or replacement of equipment, but it does not change capacity of the system (and is not required to be upsized as a result of future demands), the new development's established connection fee would cover the cost of the CIP (essentially, the connection fee established is calculated to "buy in" to that Development's fair share of the existing infrastructure). In the case where a capital project is needed to increase capacity to serve the new development, appropriate share of costs must be covered by the new development by increased connection fees, or otherwise compensated for by imposed conditions of approval (capital projects that may need to be paid for by the Developer at the time of Development).

Projects that may directly benefit existing and future developments include:

- Vertical Well (needed to serve future peak summer demands)
- Third Tank at WTP (enhances WTP treatment/storage capability to future customers)
- Headworks at WWTP (enhances treatment performance of ponds for existing and future demands)
- Brush Aerator Addition (supplemental aeration needed to serve future demands)
- 4th Sand Filter to WWTP/Effluent Disposal (needed to meet both existing and future demands when filtration is required for effluent discharge)

Implementation Schedules

A number of CIP projects will be relatively simple to implement, with little to no permitting, environmental review or engineering required. These projects can be implemented and completed within a short time frame within a single fiscal year. Other projects that will take over one year to complete include:

- Vertical Well
- Tank Mixing System
- Third Tank at WTP
- Headworks

Water CIPs

Vertical Well

A new vertical well is recommended, to increase water supply reliability to all customers, meet peak water production demands during summer months, and serve future demands. The well capacity is envisioned to be approximately 500 gpm. The current yield of the existing gallery field is around 400 gpm. This is a high priority project for the District. Having only a single source to withdraw water from the Nacimiento River (horizontal gallery wells) creates vulnerability to the water system in the event these wells are inadvertently destroyed during high river flows, as has happened in recent past. The gallery wells also tend to lose hydraulic capacity due to plugging of the media surrounding the intake wells. The new vertical well addresses both of these concerns. The new vertical well would be drilled and installed immediately adjacent to the River near the existing PS1 facility. The Project will require drilling, pump design and installation, and programming, and possibly a third pump would be installed at PS-1. Although direct access to the River is not required, a Well Permit is required, and some environmental review will be required as part of the Project. A hydrogeologist, such as Cleath-Harris Geologists will design details of the well pack and casing, and the District Engineer would design the well pump and overall equipping of the well.

Cost Allocation: As mentioned above, the vertical well will benefit all residents, in part for water supply reliability, but also to meet future and peak summer demands. The existing units at Heritage Ranch total 1,887 units. Full build-out is 2,600 units. This means that the community is 73% built out at this time. It would be reasonable to estimate that future development should pay for 27% of the total cost of the well, in addition to the standard connection fee. If the total cost of the Vertical Well is $200,000, this would equate to approximately $2,750 per new equivalent dwelling unit

(EDU), to be paid in addition to existing connection fees (or incorporate the $2,750 now and increase new connection fees accordingly). The exact math for this connection fee recommendation should be prepared by Tuckfield Associates if this is part of their scope of services. A similar factor (27%) can be applied to other CIPs that benefit future development.

Schedule:

- Environmental Review - 6 months
- Design - 3 months
- Construction - 3 to 5 months (critical path item likely pump lead time)

Actuator Replacement

This Project consists of replacing the influent and effluent actuators at the water treatment plant, 8 total. The actuators in place are the lowest model, modulating actuator that Auma sells. Due to the duty cycle and overall filter operation, the actuators are operating beyond their intended design. This leads to process issues and more frequent repairs. Auma can supply an actuator designed for our application, improving filter operation and extending the service life. This would require purchasing eight new actuators and most likely changes in programming. Operations Manager's cost estimate is $64,000. No design engineering is required for this Project. Installation of the actuators will be by Staff. There will be some SCADA/programming required of a specialty SCADA consultant. District staff will purchase one or two of the actuators first, and get a better understanding of costs and level of effort to complete the installation, before purchasing all 8 actuators. However, it is expected that all 8 actuators can be replaced within a single Fiscal Year.

Tank Mixing System

The District needs to replace the existing tank mixing system at the 2 MG reservoir, to improve and enhance water quality. This would help to reduce the generation of THMs. Staff, in conjunction with the District Engineer, will contact various vendors for options and pricing. Some good options include products provided by SolarBee (electric powered). Other options include similar mechanical mixing equipment by competitors, and "duckbill" check valve mixing systems (TideFlex or equal). The latter mixing systems do not require power, but instead operate on existing water system pressure and flows. Installation of the mixers would be by the selected Vendor or local contractor. The estimated cost for the mechanical mixing unit is approximately $40,000. Review of comparable TideFlex mixing systems indicates the cost could be on the order of $75,000 to $100,000 (installed). [An estimate of $60,000 for equipment and installation support was provided by RedValve]. New mixers will either be electric powered, or hydraulically powered. The District Engineer will work with Staff to select the appropriate mixing system. Depending on the type of system acquired, the tank may need to be: temporarily taken out of service; drained, filled and re-disinfected; cut into to make an opening large enough to install equipment.

Schedule:

- Equipment Review/Selection - 1 month
- Design - 2 months
- Construction - 3 to 4 months (critical path item, lead time for mixing equipment)

Flow Meter Replacement
The flow meters located at the water treatment plant are outdated and do not read accurately. Staff has calibrated the meters and there was no improvement. The project consists of replacing five flow meters with ultrasonic units. Programming and wiring might also be required. The estimated cost for these five units is $45,000. No design engineering is required for this Project. Installation of the flow meters will be by Staff.

Third Tank at WTP
This project consists of constructing a smaller tank at the plant to be used as either a clear well or raw water tank. The tank is expected to be in the 100,000 to 150,000 gallon size range. This tank would be utilized routinely for storage of raw water which is fed to the water treatment plant. However, during tank maintenance activities or low water supply periods, this tank would be used for potable water storage [which will require draining the tank of raw water, cleaning/rinsing the tank, filling with potable water and disinfecting prior to potable water use]. The tank would be a welded steel tank, similar to the existing two tanks, and constructed at approximately the same location and hydraulic grade line. The tank project will require engineering for the site improvements, and for developing performance specifications and drawings for which a design-build tank contractor erects the tank. If no existing geotechnical investigation reports are available, it would be recommended to conduct a geotechnical investigation at the site to identify site parameters for foundation design and seismic considerations. Some site survey is also recommended as part of the site civil design.

Schedule:
- Survey and Geotechnical - 2 months
- Design - 2 months
- Construction, including site work and tank erection - 3 to 6 months (critical path item, tank fabrication)

Rebuild Treated Water Pumps
This project involves rebuilding the remaining three pumps located at pump station three and four. Rebuilding the pumps will yield more flow (GPM) and efficiency. This project is estimated to cost $35,000. No engineering will be required.

Pump Station Covers
This project involves the installation of pump covers/weather protection at pump stations 1, 2 and 3. The estimated cost for these covers is $10,000 each, or a total of $30,000. These units are envisioned to be pre-fabricated sheds that are constructed by staff.

Equestrian Water View PRV
The isolation valves located in the Equestrian Road pressure reducing valve vault do not shut off completely. Due to this, one of the pressure reducing valves was not able to be re-built by Cla-Val. The project would consist of replacing all four isolation valves and the two Cla-Vals. Before this happens, staff needs to locate the main line valve for Equestrian at G-14. If a valve is not present or can't be located, a new valve

needs to be inserted by hot tapping the line. The estimated cost for this Work is $25,000. Staff will work with a local contractor to install the equipment.

The isolation valves located in the lower Water View PRV vault do not shut off completely. Any maintenance or repair requires approximately ten customer's water service to be shut off wile repairs/maintenance is performed. The project consists of replacing the shut off valves and installing two new Cla-Vals. This project could be grouped together with the Equestrian PRV work to save on mobilization costs. Staff will work with local contractor to install the equipment.

Sewer CIPs

Sand Filter Construction

This project would consist of completing the fourth and final sand filter. The plastic liner would need to be installed by a contractor. Staff can complete the piping and media placement with help from local contractors/suppliers. The total cost for this work is estimated at $40,000.

Headworks, Road Work and Pond 2 Baffles

This Project consists of combined ECIP-1, 2 and 3 Projects defined in the recently completed Recycled Water Study prepared by MKN Associates. This project consists of designing and constructing the headworks, re-constructing the pond liners and refurbishing the plant roads. The total cost for this Work is $1,500,000. In conjunction with this work, pond sludge will be removed and disposed of ($260,000), and will be coordinated with the pond liner and road repair work. This Project, except for sludge removal, will be funded through a low interest 20-year State Revolving Fund (SRF) loan. The sludge removal will be funded through the District's existing cash reserves.

The District should be aware that under the SRF Program, initial soft costs (planning, permitting, design, bidding) all must be "cash-flowed" by the District up until the time that the State issues Approval to Award to the successful Contractor. Once construction commences, the District may apply for reimbursement of the soft costs at construction commencement, and then resume with monthly reimbursements to cover the Contractor's monthly progress payments. The District should be prepared to fund approximately $175,000 during design; the remaining estimated $100,000 in soft costs are projected for construction management services which would be incurred during the construction phase.

Schedule:

- Preliminary Design Report - 3 months
- Loan Application - 2 months
- Environmental Review - 6 to 9 months
- Detailed Design - 4 to 6 months
- Financial Plan and Revenue Program - 3 to 4 months
- Bid Phase, Approval to Award - 2 months
- Construction - 9 to 12 months
- Overall Schedule, ~3 years

Lift Station 5

This Project consists of replacing the submersible pumps in the wet well and changing discharge point from Eagle Point to Lift Station 10. During construction of Lift Station 10, a pipe was installed in the wet well to tie into the Lift Station 5 force main. This would require locating the force main on Heritage Road and redirecting it to Lift Station 10. Staff has had issues with pumps cavitating at Lift Station 5. It is suspected that the pumps are oversized for the application. Advantages would be a slight power savings and a decrease in odor issues on Eagle Point. Pump curves need to be determined and pumps specified by the Engineer. The District can order and install the pumps. A contractor would need to intercept the force main on Heritage Road and tie it into lift station 10.

Brush Aeration Pond 2

ECIP 4. The additional of a brush aerator to Pond 2 is a recommendation (ECIP-4) in the Recycled Water Master Plan. The addition of the aerator will enhance pond mixing, reduce algal growth and improve effluent quality. Design plans will be prepared for this improvement, and the Project will be bid and then constructed by a local contractor.

Lift Station 3 Rehabilitation

The existing wetwell needs to be coated for corrosion protection, and existing piping and valves need to be replaced. Bypassing sewage around LS 3 will be the critical element to this Project. The Work will be addressed on two phases: 1) construct one bypass manhole immediately upstream of LS3 on the influent line coming from Black Horse Lane; and 2) implement the bypass, wetwell coating and valve/piping replacement work. The construction of the bypass manhole is expected to cost around $20,000; the District Engineer should work with staff and prepare a simple sketch of the desired bypass manhole configuration. The installation is very deep at this location, on the order of 22 to 24 feet. The wetwell coating, and valve/piping plans will need to be engineered, and the District Engineer is already under contract to prepare these plans and specifications. The Lift Station Project will be implemented using standard design-bid-build protocol.

Lift Station 1 Rehab

The electrical panel is outdated and the District should consider updating the controls, and should also consider coating the wetwell. The bypassing required at LS 1 will be much simpler than for LS 3. The estimated cost of this project is $75,000.

SGT:

HERITAGE RANCH COMMUNITY SERVICES DISTRICT
Water Capital Improvement Budget 5 Year

Project/Equipment	Description	Notes	Water CIP	Funding Source	5 Year CIP 2017/18	2018/19	2019/20	2020/21	2021/22
Vertical Well	design/permits-environmental	Multiple benefits, ordinance fee new development	50,000	HRCSD cash reserves	40,000	10,000	0	0	0
	construct		150,000	HRCSD cash reserves, new development fee	0	150,000	0	0	0
WTP actuator replace	8 actuators, purchase, install, programming	Replace outdated equip.	64,000	HRCSD cash reserves	64,000	0	0	0	0
Tank mixing system	2 MG tank mixing - old water problems	replace old system, reduce electrical, lower THM formation	107,000	HRCSD cash reserves	0	0	7,000	100,000	0
Flow meter replace	Influent and effluent	Replace outdated equip. (5 meters)	45,000	HRCSD cash reserves	0	0	0	45,000	0
Third tank at WTP	Design, bid	Need for tank maint., construct next CIP	32,000	HRCSD cash reserves	0	0	0	25,000	7,000
	Construct[1]		200,000	HRCSD cash reserves	0	0	0	0	200,000
Rebuild Treated water pumps at #3 and #4	Rebuild	Increase GPM of 3 pumps	35,000	HRCSD cash reserves	0	0	35,000	0	0
Pump station covers	Design, bid, construct	Protect equipment	30,000	HRCSD cash reserves	0	0	30,000	0	0
Equestrian & Waterview PRV	Rebuild / Repair	Main water line HR	50,000	HRCSD cash reserves	0	0	50,000	0	0
	Total Water		$763,000		104,000	160,000	122,000	170,000	207,000
	Funded Capital Reserves		$763,000						
	Funded Debt		$0						

Notes

[1] Construct tank in 2021/22, or possibly next CIP process or before next tank maintenance

HERITAGE RANCH COMMUNITY SERVICES DISTRICT
Sewer Capital Improvement Budget 5 Year

Project/Equipment	Description	Notes	Sewer CIP	Funding Source	5 Year CIP 2017/18	2018/19	2019/20	2020/21	2021/22
Sand filter	Add new filter #4		40,000	HRCSD cash reserves	0	0	0	0	40,000
Sludge Removal	Design, bid	WWTP ECIP 3	7,500	HRCSD cash reserves	7,500				
	Construct		260,000	HRCSD cash reserves		260,000			
Headworks screening, influent meter, road work, liner replace, pond 2 baffels[1]	system/improvement design/bid	WWTP Master Plan ECIP-1, 2, and portion of 3. Combine into 1 project	50,000	HRCSD cash reserves	25,000	25,000	0	0	0
	Debt application		20,000	Staff / Engineer time	0	20,000	0	0	0
	Construct		276,000	Debt[2]	0	0	92,000	92,000	92,000
Lift station 5 connect	Design, bid	Connect to LS 10, reduce Eagle Point odor & flow to LS 2	7,500	HRCSD cash reserves	7,500	0	0	0	0
	Construct		25,000	HRCSD cash reserves	0	25,000	0	0	0
Brush aeration pond 2		WWTP ECIP 4	60,000	HRCSD cash reserves	0	0	0	10,000	50,000
Lift Station 3 Rehabilitation	bid	Bypass MH, recoat wetwell, new piping/valves in wetwell, piping revisions in existing vault	8,000	HRCSD cash reserves	8,000	0	0	0	0
	Bypass MH, recoat well, new piping/valves		125,000	HRCSD cash reserves	50,000	75,000	0	0	0
Lift Station 1 Rehabilitation	design, bid	recoat well, new electrical, pump efficiency	8,000	HRCSD cash reserves	0	0	0	8,000	0
	rehab well, new equipment		75,000	HRCSD cash reserves	0	0	0	75,000	0
PV project STP	Design, bid	Purchase Power Agrmnt.	90,000	HRCSD cash reserves	0	0	0	0	90,000
	Total Sewer		$1,052,000		98,000	405,000	92,000	185,000	272,000
	Funded Capital Reserves		$776,000						
	Funded Debt		$276,000						

Notes

[1] $1.5 million, 20 year loan at 2%

[2] Note, in FY 2017 and 2018, District will need to "cash flow" approximately $175,000 in soft costs, will get reimbursed at the beginning of FY 2019.

WATER AND SEWER CIP BUDGET COMBINED		2017/18	2018/19	2019/20	2020/21	2021/22
FY Summary of Costs	$1,815,000	$202,000	$565,000	$214,000	$355,000	$479,000
Funded Capital Reserves	$1,539,000	$202,000	$565,000	$122,000	$263,000	$387,000
Funded Debt	$276,000			$ 92,000	$ 92,000	$ 92,000