

	<p>Mr. Miller: The concept for the Creek Discharge Program was to take highly treated recycled water and to introduce it south of Los Osos Valley Road in Los Osos Creek, where the sediment is permeable and there's communication with the Lower Aquifer. We did have a consultant perform a study to look at the feasibility and the regulatory environment for that project. It's a significant effort in terms of monitoring for the baseline, dealing with the constituents in the water, and the additional treatment that would be required to make it work. The feasibility of it had a price tag of about \$600,000. That report is posted online with our previous meetings, if you're not able to obtain it let me know and I can make sure you get a copy.</p>
<p>7b. Discussion of CHG Report on Los Osos Basin Plan Metric Trends Review and Infrastructure Program C Evaluation</p>	<p>Mr. Miller: Gave a detail on the CHG Report on the Los Osos Basin Plan Metric Trends Review and Infrastructure Program C Evaluation.</p> <p>Director Zimmer: Regarding the Program C Well we talked in other discussions that it would be Monitoring Well and I'm just not clear on how that was determined. I think renaming the Wells as you mentioned in this item is great idea and I support it. I appreciate the District taking initiative on this well the Basin Plan lists this as a joint effort since this is outside Golden State service area would this well be more in line with being a District Well at the end of the process? I'm just hoping to gain a littler clarity on how we're moving through this whether it will be joint or more of a District effort. If it is a joint effort how does the BMC fit into that role?</p> <p>Director Ochylski: From the CSD's standpoint all we're proposing to do at this point is to get proposals. It's a step by step process, and all we did was authorize Rob to go out and get a proposal before the drilling of the well. My understanding is that due to the uncertainty of the yields of that well, we've gone this route.</p> <p>Mr. Miller: Right, it was primarily looking at the capacity available at that location, we just don't have enough information that a full scale well would even be worth it. If everything did work out, then we would have the public discussion of what it would mean to drill a full-scale well at that location. Regarding the funding of the well, I suppose it was the District's acknowledgement of Golden State's efforts to fund its expansion well and take our fair share of the burden to fund the first steps of this well. Depending on its location the regional intertie would be available to move water around if that was prudent for the Basin. There are no final arrangements in our minds at this point.</p> <p>Director Zimmer: I appreciate those comments because the information that we've talked about and have before us today is just the beginning of the trail, and I don't want to start down a trail without fulling understanding what those commitments are and trying to provide assistance and resource as we move through that.</p> <p>Director Gibson: All the wells and water resources are to be managed in a cooperative manner to provide water for this community.</p> <p>Director Ochylski: If you look at the chart it talks about cooperative funding. Golden State took the lead on the first well so now we are trying to do our part. After the workshop this location out of all the options seemed to have the biggest concerns about its viability and ability to provide the amount of water that would be required.</p> <p>Director Cote: I have many comments on this document but if we aren't approving this right now, I can just talk to staff about them.</p> <p>Director Ochylski: I don't see us approving this today, so you may just want to submit those comments in writing. If there's something you feel we need to discuss then bring it</p>

up, otherwise you can just forward those on to Rob. When we bring it back for adoption than we can talk in more detail.

Director Cote: I do have a couple of comments I feel we should discuss. On page 5, PDF 41, second paragraph, I have an issue with it talking about possible/probable problems with Chloride Metric data from one of these wells. I don't know if the committee should talk about funding a special study for this, but it is fundamental for what we're doing here. On Page 4, PDF 39, regarding the talk about the Sandspit Wells having some issues measuring density and Spencer is suggesting we have a surveyor go out. So, do we need to fund a study to take a look at those Sandspit Wells?

Director Ochylski: I think when we talk about Work Program, we may want to bring that discussion up because that is a later agenda item.

Mr. Miller: Those are not huge ticket items. We already have some well surveying proposed for next year and access to the Sandspit is a little challenging. Regarding the potential problems of Chloride Metric data, perhaps there's some more analytical signatures we can get that we haven't obtained yet, if there is a way to do that cost effectively.

Director Cote: On Page 5 paragraph 4, there's a mention that the nitrate levels observed in a 30-day average in September were 2ppm which is low and is good news. However, it's interesting that the WWTP permit allows much higher nitrate than that.

Public Comment

Mr. Walker: When the chairman says it's incremental the 4th or 5th time it's important for a trail since we sometimes get committed to increments. The estimated 2 costs of a monitoring well and full-time production well. Is there huge savings? I know we talked about them, but I couldn't understand the merit of each of those.

Mr. Cesena: Representing the CSD's Utility Advisory Committee, I think this is a very thorough report. We shared some of the same concerns as Charlie mentioned with the chloride contamination and Sandpit water level criteria reevaluation. Some other minor comments about reference to tables that weren't included in this on page 7 the recycled water distribution discussion also maybe the mitigation factors for each of the 6 different options for disposal could be included. The key thing is that discussion about the need for the additional well and the flexibility that it will add to the operations, particularly that concept of increasing sustainable yield even though you're really using the same run times.

Mr. Margetson: The mitigation factors are very important to be in that report. When other agencies/boards are looking at this and we as the public are talking about the mitigation factors, they look at us like they have no idea what we're talking about.

Ms. Owen: Regarding the letter that was drafted by the Los Osos Groundwater Committee, it mentions that "additional wells will not reduce seawater intrusion..." could you please clarify whether we pump out of the back end of the basin or out of the front end we have a limited supply unless we get some more rainfall. The letter later reads "this could lead to the completion of new residential developments..." we should not be talking about development at this time. Also, we have no idea how much water the private wells are using.

Director Ochylski: I'm not sure of the letter Ms. Owen referenced.

Mr. Miller: They were comments from a community group that drafted a letter under Mr. Goodrich.

Mr. Brannon: I'm looking at the Cleath Harris report under the Los Osos Valley Ground Water Basin Modification Request, it appear there seems to be an eastward creep of the boundary. I'm looking at Page 23 of the report and it shows that that the eastward line is on the other side of the cemetery mesa. I'd like to point out a report that was done by the USGS in 1988 that talks about the hydrology and water resources of the valley. In the report they say that there is little to no groundwater entering the basin from the east end of the valley for two reasons: the first being shallow slopes and thin clay soils hinder the horizontal movement of water, and second is the mesa-like terrace at the east end of the basin creates a local ground water mound. You've drawn the eastern boundary outside of the basin and it may need to be reevaluated.

Board Comments

Mr. Miller: For the contrast between a permanent well and a monitoring well, it's probably a factor of 10 between those two. Where a monitoring well in this case might be \$60,000 and a permanent well would be about ten times that.

Director Gibson: The action that is being taken is to test this location for a production well. So, if the test well is sufficient a production well could be pursued, and if not, then it could become a monitoring well.

Mr. Miller: Regarding mitigation factors and some of that background into the report, I think that would strengthen the report and I agree with that. In regard to shifting water productions to enhance yield, it's one of the most hotly contested issues, but note we are starting to see some physical data supporting the conclusion that recovering water levels on the west side results in a retreat of the chloride and in turn a better yield of the Basin.

Director Gibson: I think people visualize pumping from the Basin is like pumping from a bathtub. In terms of this physical effect we're pumping from a running stream. Down near the front of the Basin it does make a difference where you pump the water.

Mr. Miller: Regarding the Basin boundary I think we'll follow up on that offline and take a look at that report.

Director Ochylski: I think also in that regard, DWR is the controlling agency there, we can't set the boundary. We'll be discussing this again at our next meeting.

Director Gibson: As I look at the intention of this report it's to describe the trends of the metrics and to talk about evaluating the Program C Infrastructure. I think that the report does that. I think the addition of the mitigation factors is fine, but it is describing the reality. I think the one thing that I'm curious about is the question of the chloride metric and the extent that well bore flow is going to affect that. I think we need to resolve that issue. How soon can that issue be resolved?

Mr. Miller: I would have to get back to you on that, there could be some chemical signatures that we could look for.

Director Gibson: I think we need to resolve this before we issue the final report.

<p>7c. Los Osos Seawater Intrusion Imaging – Partnership with Cal Poly</p>	<p>Mr. Miller: Gave a detailed presentation of the planned Los Osos Seawater Intrusion Imaging – Partnership with Cal Poly.</p> <p>Director Ochylski: My question was that this isn't public property, so how would you get permission from the underlying property owner?</p> <p>Mr. Miller: Two of the owners I know personally so I might be able to help.</p> <p>Director Gibson: I'm also willing to help since the County is in the center of all of this.</p> <p>Director Ochylski: My second question was with the snail and Fish and Wildlife I don't know how we could get them to agree to this, I imagine we would have to have monitoring while this happens.</p> <p>Director Gibson: I think it's worth exploring.</p> <p>You mentioned doing this year after year. Is the data only good after a couple years or would we get something good back after doing this the first time?</p> <p>Mr. Miller: I think after the first time, and I think you were going to do it twice a year Mr. Jasbinsek?</p> <p>Mr. Jasbinsek: I think twice a year is a reasonable imposition on the land owners, but more is always better. We would get good data every time and we would see how things are changing over time. We would need about a kilometer line to get reliable readings, but saltwater is a very easy target for this type of testing.</p>
<p>7d. Discussion of 2019 Priorities and Budget</p>	<p>Mr. Miller: Gave details on the 2019 Priorities and Budget.</p> <p><u>Public Comment</u></p> <p>Ms. Owen: Rob has done a great job and if we get one more year out of him that would be wonderful. The enhanced rebates for conservation, I feel there is zero information available to the community. How can we alert the community to get involved for some of these conservation rebates and assistance? Regarding the septic tank conversions, how many tanks are waiting for conversion? What will the conversion look like?</p> <p>Mr. Miller: We did send out a postcard and invited everyone to a conservation workshop which was well attended. We also had a flyer that was sent out talking about the different programs, we probably need to do that again. As far as the pilot program for the septic tank conversions I still think there are hundreds of septic tanks that were cleaned and closed but never converted. If the committee is interested in making some funding available this would be an opportunity to do that as part of this budget cycle.</p> <p>Director Gibson: There is draft of the Los Osos Community plan available for review right now. There is also an EIR coming as well, we hope to get it in front of our planning commission in the first part of next year, which I hope is by the end of the first quarter. We hope to get it to the coastal commission by the end of the year. One of the key parts of this will be getting the Coastal Commission staff up to date on our water management activities.</p>

	<p>Mr. Miller: Just to be clear these are the regular annual items that aren't associated with our 2019 work program, such as the annual report that's not listed here, and we have to administer our meetings as well.</p> <p>Director Zimmer: Would this budget put us in a better position for some grant funding for this project? If not, what is our next step? I think you also mentioned a consultant.</p> <p>Mr. Miller: I will bring all those details back. In essence, of the \$600,000 total, some of the initial tasks were low lying like the baseline monitoring. You already attracted some additional funding for that. Since there are other groups that do monitoring, our hope is as we step out and do some, we can encourage some potential partners. The soil aquifer treatment was one of the initial tasks to look at, and how that column of sand in the creek bottom could help remove carbon from the water. The \$5,000 would be a subset of that to have a consultant do a formal grant search quarterly and to reach out to partner entities and do a brief write up to the committee.</p> <p>Director Zimmer: The flow from the Wastewater Project has that changed since we looked at it before?</p> <p>Mr. Miller: In our last meeting we talked about that 500,000 gallons per day and staff perspective is that augmenting that flow should be a committee priority. We'll put some seed money in for storm water recovery, many communities in California are jumping on that process and getting grant funding for it.</p> <p>Director Zimmer: On conservation communication the Golden State web site has a lot of information on it.</p> <p>Director Ochylski: We also have the same thing on the CSD website.</p> <p>Director Gibson left the meeting.</p> <p>Director Cote: So, is this \$200,000 additional above the normal budget? All of our entities have budgeted for 2019. I'm curious if S&T MWC has budgeted enough? I like all these additions here, are we looking at an additional \$200,000 budget?</p> <p>Mr. Miller: No, if you look at last year, we were carrying the \$110,000. If you look at last years budget it was \$300,000 including contingencies and including 115,000 for the Cuesta by the Sea Monitoring Well and that is a carry forward, about \$60,000 to do the annual report, \$50,000 for administration and the contingency was about \$30,000. A lot of the budget would be absorbed into these items, so it's about a 20% increase and your portion would be about 4% of that.</p>
<p>8. PUBLIC COMMENTS ON ITEMS NOT APPEARING ON THE AGENDA</p>	<p><u>Public Comment</u></p> <p>Ms. Owen: Can we talk about the nitrate treating and blending with the upper and lower aquifer, it gives us access to water we don't talk about very much. Will we be doing more of that?</p> <p>Mr. Miller: It's an astute comment, Program B was enhancing and expanding the use of that upper aquifer water. It's expensive to do the denitrifying but it is an available resource that we have not fully utilized.</p>
<p>9. ADJOURNMENT</p>	<p>Meeting was adjourned at 3:07 pm.</p> <p>The next meeting will be on January 16th at the South Bay Community Center in Los Osos at 1:30 pm.</p>

TO: Los Osos Basin Management Committee

FROM: Rob Miller, Interim Executive Director

DATE: January 16, 2019

SUBJECT: Item 5b – Approval of Budget Update and Invoice Register through December 31, 2018

Recommendations

Staff recommends that the Committee review and approve the report.

Discussion

Staff has prepared a summary of costs incurred as compared to the adopted budget through December 31, 2018 (see Attachment 1). A running invoice register is also provided as Attachment 2. Several past invoices are included that were not received or approved by the BMC in 2017. These invoices are included within the 2018 contingency line item. Staff recommends that the Committee approve all pending invoices, outlined in Attachment 3. Payment of invoices will continue to be processed through Brownstein Hyatt as noted in previous meetings.

Attachment 1: Cost Summary (Year to Date- Dec. 31, 2018) for Calendar Year 2018

Item	Description	Budget Amount	Costs Incurred	Percent Incurred	Remaining Budget
1	Monthly meeting administration, including preparation, staff notes, and attendance	\$50,000	\$44,591.25	89.2%	\$5,409
2	Meeting expenses - facility rent (if SBCC needed for larger venue)	\$1,000	\$495.00	49.5%	\$505
3	Meeting expenses - audio and video services	\$6,000	\$4,525.00	75.4%	\$1,475
4	Adaptive Management - Groundwater Modeling	\$10,000	\$9,985.00	99.9%	\$15
5	Semi annual seawater intrusion monitoring	\$26,400	\$26,392.61	100.0%	\$7
6	Annual Report - not including Year 1 start up costs	\$29,600	\$29,565.00	99.9%	\$35
7	Grant writing (outside consultant)	\$5,000	\$0.00	0.0%	\$5,000
8	Creek Recharge and Replenishment Studies	\$15,000	\$0.00	0.0%	\$15,000
9	Cuesta by the Sea Monitoring well	\$115,000	\$3,150.00	2.7%	\$111,850
10	Conservation programs (not including member programs)	\$10,000	\$4,865.46	48.7%	\$5,135
	Subtotal	\$268,000	\$123,569		\$144,431
11	10% Contingency	\$26,800	\$1,695.00		
	Total	\$294,800	\$125,264	42.5%	\$169,536
	LOCSO (38%)	\$112,024			
	GSWC (38%)	\$112,024			
	County of SLO (20%)	\$58,960			
	S&T Mutual (4%)	\$11,792			
Notes	Last update Jan. 7, 2019				

Attachment 2: Invoice Register for Los Osos BMC for Calendar Year 2018 (through Dec. 31, 2018)

Vendor	Invoice No.	Amount	Month of Service	Description	Budget Item	BMC Approved
CHG	20180203	\$11,095.00	Feb-18	Annual Report	6	Yes
Wallace Group	45523	\$5,325.00	Jan-18	Administration	1	Yes
CHG	20180303	\$10,260.00	Mar-18	Annual Report	6	Yes
CHG	20180304	\$1,320.00	Mar-18	Semi-annual groundwater monitoring	5	Yes
CHG	20180305	\$840.00	Mar-18	Cuesta-By-The-Sea Monitoring Well	9	Yes
Wallace Group	45731	\$3,475.47	Feb-18	Administration	1	Yes
Wallace Group	45911	\$4,456.16	Mar-18	Administration	1	Yes
SBCC	99	\$120.00	Jul-18	Meeting Expenses-Facility Rent	2	Yes
SBCC	113	\$120.00	Mar-18	Meeting Expenses-Facility Rent	2	Yes
AGP	7383	\$750.00	May-18	Meeting expenses - audio and video services	3	Yes
CHG	20180402	\$5,340.00	Apr-18	Annual Report	6	Yes
CHG	20180403	\$5,874.80	Apr-18	Semi-annual groundwater monitoring	5	Yes
CHG	20180504	\$2,870.00	May-18	Annual Report	6	Yes
CHG	20180505	\$3,316.50	May-18	Semi-annual groundwater monitoring	5	Yes
Wallace Group	46110	\$2,033.00	Apr-18	Administration	1	Yes
Wallace Group	46301	\$6,511.61	May-18	Administration	1	Yes
AGP	7414	\$1,450.00	Jun-18	Meeting Expenses-Audio/Video Services	3	Yes
CHG	20180604	\$625.00	Jun-18	Semi-annual groundwater monitoring	5	Yes
CHG	20180605	\$6,860.00	Jun-18	Adaptive Management-Groundwater Modeling	4	Yes
Wallace Group	46487	\$5,868.91	Jun-18	Administration	1	Yes
Wallace Group	46487	\$3,919.41	Jun-18	Water Conservation	10	Yes
Wallace Group	46715	\$1,292.00	Jul-18	Administration	1	Yes
Wallace Group	46715	\$1.39	Jul-18	Water Conservation	10	Yes
CHG	20180705	\$1,400.00	Jul-18	Adaptive Management-Groundwater Modeling	4	Yes
AGP	7498	\$775.00	Aug-18	Meeting Expenses-Audio/Video Services	3	Yes
SBCC	117	\$135.00	Aug-18	Meeting Expenses-Facility Rent	2	Yes
CHG	20180807	\$1,725.00	Aug-18	Adaptive Management-Groundwater Modeling	4	Yes
CHG	20180932	\$900.00	Sep-18	Cuesta-By-The-Sea Monitoring Well	9	Yes
CHG	20180903-Rev	\$960.00	Sep-18	Semi-annual groundwater monitoring	5	Yes
CHG	20180806-Rev	\$1,410.00	Aug-18	Cuesta-By-The-Sea Monitoring Well	9	Yes
Wallace Group	46853	\$4,767.91	Aug-18	Administration	1	Yes
Wallace Group	46853	\$70.13	Aug-18	Water Conservation	10	Yes
Wallace Group	47048	\$5,597.00	Sep-18	Administration	1	Yes
Wallace Group	47048	\$314.53	Sep-18	Water Conservation	10	Yes
Wallace Group	47209	\$2,618.00	Oct-18	Administration	1	
Wallace Group	47411	\$2,646.13	Nov-18	Administration	1	
CHG	20181127	\$14,296.31	Nov-18	Semi annual seawater intrusion monitoring Cuesta-By-The-Sea-Monitoring-Well	95	
AGP	7568	\$750.00	Nov-18	Meeting Expenses-Audio/Video Services	3	
AGP	7311	\$800.00	Mar-18	Meeting Expenses-Audio/Video Services	3	
SBCC	121	\$120.00	Nov-18	Meeting Expenses-Facility Rent	2	
SBCC	114	\$560.00	Jun-18	Water Conservation	10	
SBCC	110	\$120.00	Sep-17	(Contingency) Meeting Expenses-Facility	11	
AGP	7113	\$800.00	Sep-17	(Contingency) Meeting Expenses-Audio/Vid	11	
AGP	7186	\$775.00	Nov-17	(Contingency) Meeting Expenses-Audio/Vid	11	
Total		\$125,264.26				

To be approved

ATTACHMENT 3

Current Invoices Subject to Approval for Payment (Warrant List as of December 31, 2018):

Vendor	Invoice #	Amount of Inv.	Date of Services
Wallace Group	47209	\$2,618.00	Oct.-2018
Wallace Group	47411	\$2,646.13	Nov.-2018
Wallace Group			Dec.-2018
CHG	20181127	\$14,296.31	Nov.-2018
AGP	7568	\$750.00	Nov. 2018
AGP	7311	\$800.00	Mar. 2018
SBCC	121	\$120.00	Nov. 2018
SBCC	114	\$560.00	Jun. 2018
SBCC	110	\$120.00	Sep. 2017
AGP	7186	\$775.00	Nov. 2017
AGP	7113	\$800.00	Sep. 2017

TO: Los Osos Basin Management Committee

FROM: Rob Miller, Interim Executive Director

DATE: January 16, 2019

SUBJECT: Item 6 – Executive Director’s Report

Recommendations

Staff recommends that the Committee receive and file the report, and provide staff with any direction for future discussions.

Discussion

This report was prepared to summarize administrative matters not covered in other agenda items and also to provide a general update on staff activities.

Funding and Financing Programs to Support Basin Plan Implementation

As indicated in the January 2018 meeting the State Board confirmed that sea water intrusion mitigation projects under Program C are eligible for low interest loans but are not currently eligible for grants under Proposition 1. New wells in the upper and lower aquifer are viewed as aquifer management, not aquifer clean-up as defined by the State, therefore we will need to look for future funding rounds and other opportunities. Staff has engaged in the IRWM process with SLO County for the Los Osos Creek Replenishment and Recharge Project (IRWM Project ID 2017 NT-07). Additional BMC funding for this project is also included in the proposed 2019 budget (see Item 7d). The concept of urban storm water recovery at 8th and El Moro was ranked in the draft County Stormwater Resource Plan, and future grant opportunities may be available. Planning funding for this project is included in the proposed 2019 BMC Budget. The draft Stormwater Resource Plan can be found here:

<https://www.slocounty.ca.gov/Departments/Public-Works/Forms-Documents/Committees-Programs/Stormwater-Resource-Plan/Documents/2018-09-10-SWRP-Public-Draft.aspx>

Status of Zone of Benefit Analysis

Similar to previous updates, no special tax measure is being pursued by staff to fund BMC administrative or capital costs. This item has been removed from the BMC budget for 2019. The Zone of Benefit approach can be initiated at any time as directed by the BMC.

Sustainable Groundwater Management Act (SGMA) and Basin Boundary Modification Request (BBMR) Updates

BBMR Update: On November 29, 2018, the California Department of Water Resources (DWR) published the Draft Recommendations for the Basin Boundary Modifications Request (BBMR). A summary of DWR's Draft Recommendations for the Los Osos Basin BBMR are listed below:

- DWR approved the creation of two jurisdictional subbasins: Los Osos Subbasin and Warden Creek Subbasin
- DWR approved the removal of the southern fringe area including Montana de Oro State Park (State Park Exclusion)
- DWR denied removal of the minor northern fringe area (Minor Fringe Area Exclusion)

DWR's Steps to Finalize Basin Boundaries & Priorities:

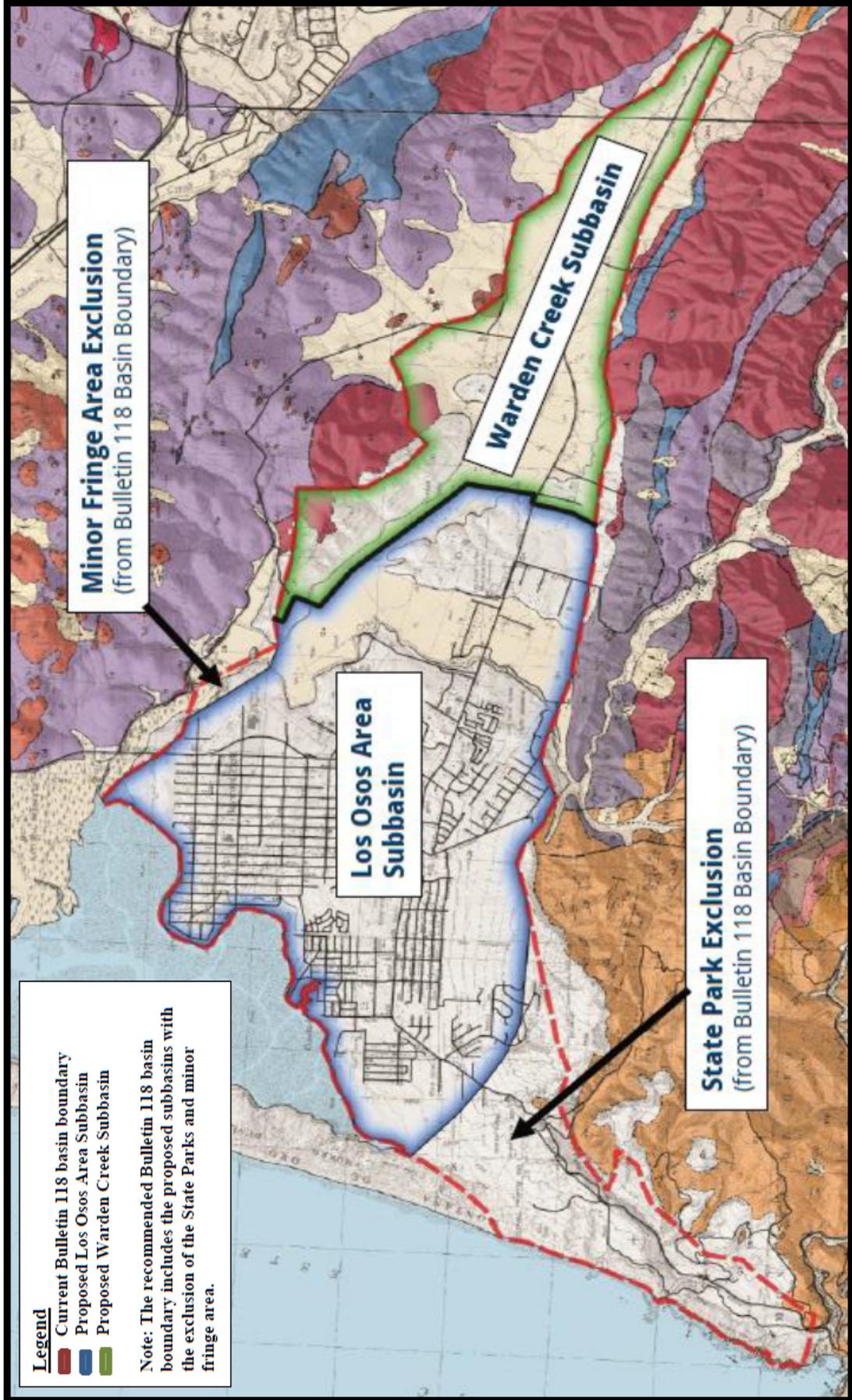
- January 4, 2019 – DWR public comment period for the Draft Recommendations closed
- January 16, 2019 – DWR presents the Draft Recommendations and public comments received to the California Water Commission
- February 2019 - DWR Final Basin Boundary Modifications released
- April/May 2019 - DWR reprioritizes basins/subbasins (using modified boundaries)

More information on DWR's basin boundary modification process and prioritization process, please visit:

<https://water.ca.gov/Programs/Groundwater-Management/Basin-Boundary-Modifications>

<https://water.ca.gov/Programs/Groundwater-Management/Basin-Prioritization>

Figure 1. Proposed Los Osos Basin Boundary Modification



Los Osos Wastewater Project Flow and Connection Update

Influent flows into the treatment facility are peaking at 0.50 mgd. No recycled water deliveries have been made to irrigation users yet. Effluent is being disposed to both Broderson and Bayridge leachfields. The cumulative effluent disposal for calendar year 2018 was 507 AF of which 487 AF went to Broderson, 19.8 AF went to Bayridge, and 0.2 AF was used as construction water.

The sewer service area currently has a 97.7% connection status. Of the 107 unconnected properties, 14 are waiting for the County low-income grant program to pay for their connection leaving 93 properties that may require enforcement. Of the 93 properties, 32 are in the process of connecting (ie: obtained a building permit). Subtracting households with permits leaves 61 properties (1.3% of 4582 total parcels) that are the focus of the Code enforcement process. A list of the 61 properties was transferred to the County Planning and Building Department on 11/13/2018. Code Enforcement was tasked with notifying properties with Notice of Violations and impending fines.

Water Conservation Update

Rebate activity continues to be minimal, with no updates since the last meeting.

Option to Bring Morro Bay Wastewater to Los Osos WWRF

Similar to staff's last update, it was determined that both summer and winter peak day flows at the City of Morro Bay are expected to exceed the available capacity in the Los Osos Wastewater Reclamation Facility, and therefore an expansion would be required to accommodate the higher flows. A number of peak day flows of over 3 mgd have been observed at the existing Morro Bay facility. Additional information on the Morro Bay project can be found here: <http://morrobaywrf.com/>.

TO: Los Osos Basin Management Committee
FROM: Rob Miller, Interim Executive Director
DATE: January 16, 2019
SUBJECT: Item 7a: Appointment of BMC Officers for Calendar Year 2019

Recommendations

Staff recommends that the Committee retain the existing officers for calendar year 2019.

Discussion

The adopted Rules and Regulations (January 2016) for the BMC require appointment of the Committee's officers as noted in the excerpt below from Section 4.2:

Appointment of Officers. The officers shall be appointed annually by, and serve at the pleasure of, the Basin Management Committee. Officers shall be elected at the first Basin Management Committee meeting, and thereafter at the first Basin Management Committee meeting following December 1 of each year. An Officer may serve for multiple consecutive terms. Any Officer may resign at any time upon written notice to the Basin Management Committee. The Secretary or Treasurer may be removed and replaced by an affirmative decision of the Basin Management Committee.

The current BMC officers are as follows:

Director Ochylski: Chairperson

Director Zimmer: Vice Chairperson

Director Cote: Secretary (replacing Director Garfinkel, who was appointed on 12/15/15)

Director Gibson: Treasurer

Staff's recommendation is to retain the existing officers, though adjustments could also be made at the meeting if desired.

TO: Los Osos Basin Management Committee

FROM: Rob Miller, Interim Executive Director

DATE: January 16, 2019

SUBJECT: Item 7b. – Update on Status of Basin Plan Infrastructure Projects

Recommendations

Receive report and provide input to staff for future action.

Discussion

The Basin Management Plan for the Los Osos Groundwater Basin (Plan) was approved by the Court in October 2015. The Plan provided a list of projects that comprise the Basin Infrastructure Program (Program) that were put forth to address the following immediate and continuing goals:

Immediate Goals

1. Halt or, to the extent possible, reverse seawater intrusion into the Basin.
2. Provide sustainable water supplies for existing residential, commercial, community and agricultural development overlying the Basin.

Continuing Goals

1. Establish a strategy for maximizing the reasonable and beneficial use of Basin water resources.
2. Provide sustainable water supplies for future development within Los Osos, consistent with local land use planning policies.
3. Allocate costs equitably among all parties who benefit from the Basin's water resources, assessing special and general benefits.

The Program is divided into five parts, designated Programs A through D and Program M. Programs A and B shift groundwater production from the Lower Aquifer to the Upper Aquifer, and Programs C and D shift production within the Lower Aquifer from the Western Area to the Central and Eastern Areas, respectively. Program M was also established in the Basin Management Plan for the development of a Groundwater Monitoring Program (See Chapter 7 of the BMP), and a new lower aquifer monitoring well in the Cuesta by the Sea area was recommended in the 2015 Annual Report. Program U is the Urban Water Reinvestment Program that addresses the use of recycled water within the Basin. The attached table provides a comprehensive project status and summary.

Project Name	Parties Involved	Funding Status	Capital Cost	Status
Program A				
Water Systems Interconnection	LOCSD/ GSWC	Completed		
Upper Aquifer Well (8 th Street)	LOCSD	Fully Funded	\$250,000	Well was drilled and cased in December 2016. Budget remaining \$250,000 to equip the well. Design is 100% complete and District is pursuing IRWM matching funds. If available, it is hoped that matching funds will be available by Q1 of 2019. Completion of construction is expected by August 2019.
South Bay Well Nitrate Removal	LOCSD	Completed		
Palisades Well Modifications	LOCSD	Completed		
Blending Project (Skyline Well)	GSWC	Completed		
Water Meters	S&T	Completed		
Program B				
LOCSD Wells	LOCSD	Not Funded	BMP: \$2.7 mil	Project not initiated
GSWC Wells	GSWC	Not Funded	BMP: \$3.2 mil	Project not initiated
Community Nitrate Removal Facility	LOCSD/GSWC	Partial	First phase combined with GSWC Program A	GSWC's Program A Blending Project allows for incremental expansion of the nitrate facility and can be considered a first phase in Program B.

Project Name	Parties Involved	Funding Status	Capital Cost	Status
Program C				
Expansion Well No. 1 (Los Olivos)	GSWC			Completed
Expansion Well No. 2	LOCSD is currently leading the project with potential GSWC involvement, depending on final location	LOCSD is currently leading the project with respect to funding	BMP: \$2.0 mil	Property acquisition phase is on-going through efforts of LOCSD. Four sites are currently being reviewed and a community workshop was held on 8/30/2018. Due to community concerns over siting, environmental review and permitting is expected to be on going through Q1 of 2020, with construction complete by Q1 of 2021. The LOCSD authorized the preparation of bid documents for a test well at Site A (Los Osos Middle School) at their 11/1/18 meeting. Draft documents have been prepared, and staff is working on drilling details with the School District prior to going out to bid. The test hole is expected to be completed in Q1 or early Q2 of 2019.
Expansion Well 3 and LOVR Water Main Upgrade	GSWC/LOCSD	Cooperative Funding	BMP: \$1.6 mil	This project has been deferred under Adaptive Management.
LOVR Water Main Upgrade	GSWC	May be deferred	BMP: \$1.53 mil	Project may not be required, depending on the pumping capacity of the drilled Program C wells. It may be deferred to Program D.
S&T/GSWC Interconnection	S&T/ GSWC	Pending	BMP: \$30,000	In conceptual design
Program M				
New Zone D/E lower aquifer monitoring well in Cuesta by the Sea	All Parties	Funded through BMC Budget	\$115,000	A wetlands delineation was completed in July 2018. A Minor Use Permit Application was submitted and awaiting County determination for completeness. Anticipated to go to hearing on February 1, 2019, with bidding to follow. Construction is expected in Q2 of 2019. The project implementation cost has been included in the draft 2019 budget.

Program U				
Creek Discharge Program	All Parties	Funded through BMC Budget/grants	\$582,000 through feasibility phase	The 2019 draft budget includes funding for limited baseline monitoring and Soil Aquifer Treatment evaluation in the amount of \$50,000.

Los Osos Basin Management Committee
Basin Plan Infrastructure Projects

ID	Task Name	2018				2019				2020				2021			
		Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	
1	Program A: Upper Aquifer Well (8th Street)																
2	Engineering																
3	Matching Funds Available																
4	Bidding and Construction																
5	Program C: Expansion Well #2																
6	Land Acquisition Phase																
7	Environmental Studies and Coastal Development Permit																
8	Engineering																
9	Bidding and Construction																
10	Program M: New Zone D/E lower aquifer monitoring well in Cuesta by the Sea																
11	Design																
12	Permitting/Planning Commission Hearing																
13	Bidding and Construction																

TO: Los Osos Basin Management Committee

FROM: Rob Miller, Interim Executive Director

DATE: January 16, 2019

SUBJECT: Item 7c – Discussion of CHG Report on Los Osos Basin Plan Metric Trends Review and Infrastructure Program C Evaluation

Recommendation

Consider LOCSD comments on draft report and provide input to staff for future action.

Discussion

In March 2018, the BMC retained Cleath Harris Geologists (CHG) to prepare a study evaluating Basin Infrastructure Program C in the context of current water demand and basin metrics. The draft results of this study were released as part of the August 2018 BMC meeting. A revised draft was released as part of the November 2018 BMC meeting, which included clarifications on well numbering and sequence of installation. This new draft has not changed since the November 2018 meeting, but it is attached for ease of reference.

During the November meeting, the BMC expressed concerns regarding borehole contamination that could influence lower aquifer monitoring results. CHG has included an additional task in the 2018 Annual Report proposal for further evaluation of wellbore flow and Upper Aquifer influence at LA10 using 2018 water quality results. This task will provide mixing calculations and assumptions that will help the BMC understand the range of uncertainty in the chloride metric at that well. Any additional steps that would be beneficial in reducing the uncertainty would be recommended in the 2018 Draft Annual Report. CHG has already considered various tests that might be performed at the well, but they are not expected to be conclusive or particularly helpful at this time, so staff is not proposing any immediate testing. Also, staff confirmed that the sand spit wells were previously surveyed, and the 2019 budget includes additional survey effort to reduce datum uncertainty at other critical wells.

The LOCSD discussed the draft report during their December 2018 meeting, and the District Board approved the attached comment letter unanimously.

Cleath-Harris Geologists, Inc.
71 Zaca Lane, Suite 140
San Luis Obispo, CA 93401
(805) 543-1413



Technical Memorandum

Date: August 27, 2018

From: Spencer Harris, HG 633

To: Rob Miller, P.E., Interim Executive Director
Los Osos Groundwater Basin Management Committee

SUBJECT: Los Osos Basin Plan Metric Trends Review and Infrastructure Program C Evaluation (DRAFT).

Dear Mr. Miller:

Cleath-Harris Geologists (CHG) has performed a metric trends review and basin infrastructure Program C evaluation as part of adaptive management for 2018. The purpose of this effort was to provide the Los Osos Basin Management Committee (BMC) with information and recommendations for making adjustments to the Los Osos Basin Plan (LOBP), as appropriate, based on a comparison of current basin metric trends with the anticipated trends, along with an evaluation of Program C using an updated existing population scenario. This memorandum presents the results of the adaptive management review.

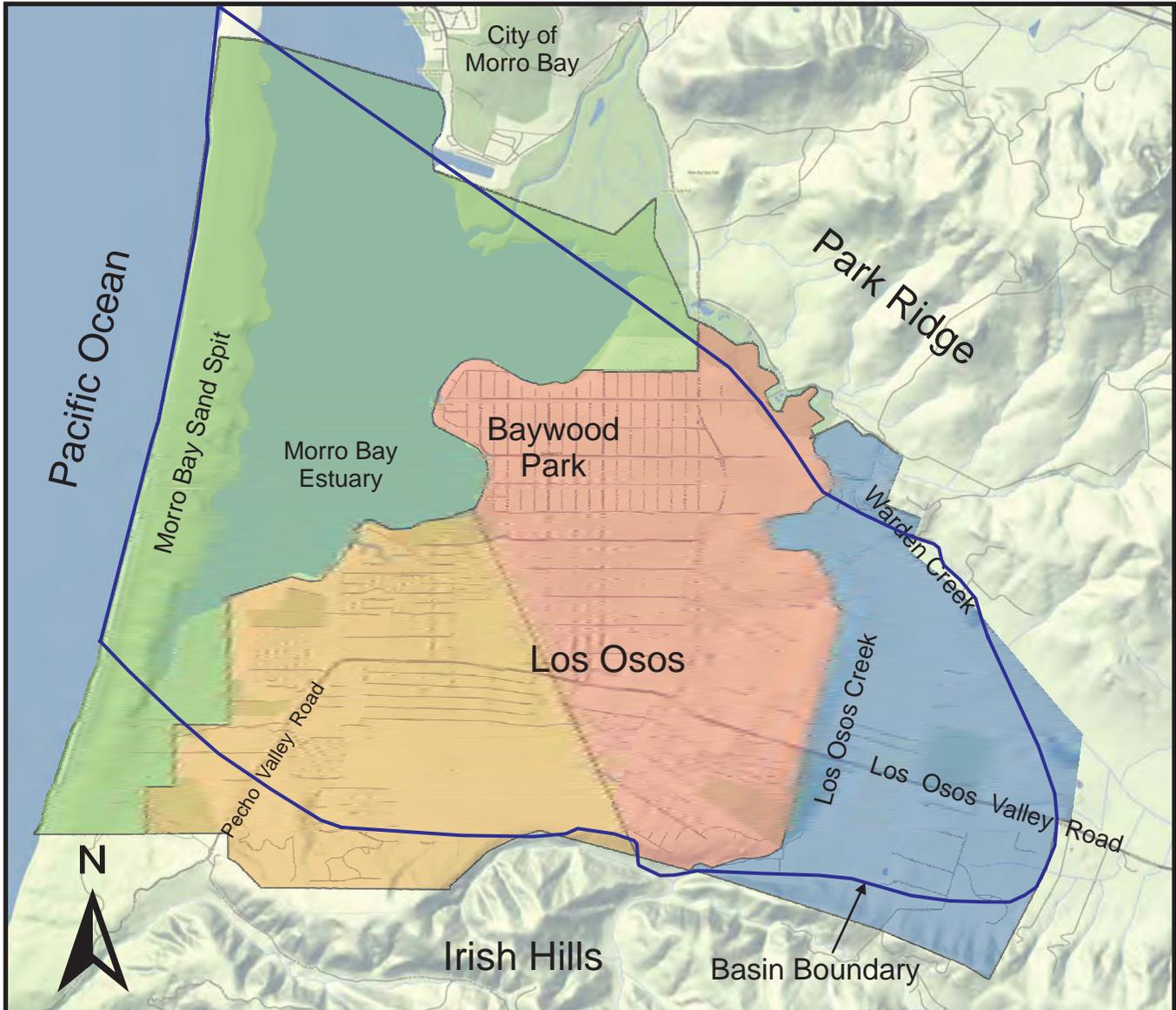
Background

BMC members include water purveyors Golden State Water Company (GSWC), Los Osos Community Services District (LOCSD), and S&T Mutual Water Company, along with the County of San Luis Obispo. The basin refers to the adjudicated portion of the Los Osos Valley Groundwater Basin (DWR Basin 3-8), for which a Stipulated Judgment and the LOBP were approved by the San Luis Obispo Superior Court in October 2015. Figure 1 shows the basin and associated plan area boundaries. A brief overview of Program C and the basin metrics is provided below.

Basin Infrastructure Program C

Program C includes a set of infrastructure improvements that would allow the water purveyors to shift some groundwater production within the Lower Aquifer from the Western Area to the Central Area (Figure 1). Groundwater production from the Central Area generally results in less seawater intrusion than the same amount of production from the Western Area, which increases the sustainable yield of the Basin. Program C consists of three Expansion Wells located on the eastern side of the Central Area and associated pipelines. Implementation of Program C would have a direct, beneficial impact on mitigating seawater intrusion. (LOBP; ISJ, 2015).

DRAFT



Base Image: Stamen-Terrain

Explanation

Los Osos Basin Plan Areas:

 Dunes and Bay Area

 Western Area

 Central Area

 Eastern Area

 Basin Boundary from Los Osos Basin Plan

0 2000 4000 6000 8000 ft

Scale: 1 inch ≈ 4,000 feet

Figure 1
Basin Location and Plan Areas
Los Osos Groundwater Basin
2018 Adaptive Management TM

Cleath-Harris Geologists



General areas for the Program C Expansion Wells were described in the LOBP. These areas, with some adjustments noted below, are shown in Figure 2.

South Expansion Well Area - Vicinity of the mobile home parks south of Los Osos Valley Road in the GSWC service area.

Central Expansion Well Area - Vicinity of Andre Avenue and Buckskin Avenue in the GSWC service area, similar to the original area identified for Expansion Well No. 2 in the LOBP.

North Expansion Well Area - Vicinity of north end of Sage Avenue east of the LOCSO service area. The area also includes a site currently under consideration in the south parking lot of the Los Osos Middle School play fields.

Expansion Well No. 1 (COMPLETED) - Originally planned in the vicinity of Buckskin Avenue north of Los Osos Valley Road and within the GSWC service area. GSWC relocated Expansion Well No. 1 to Los Olivos Avenue, and constructed a new Lower Aquifer well there in 2016.

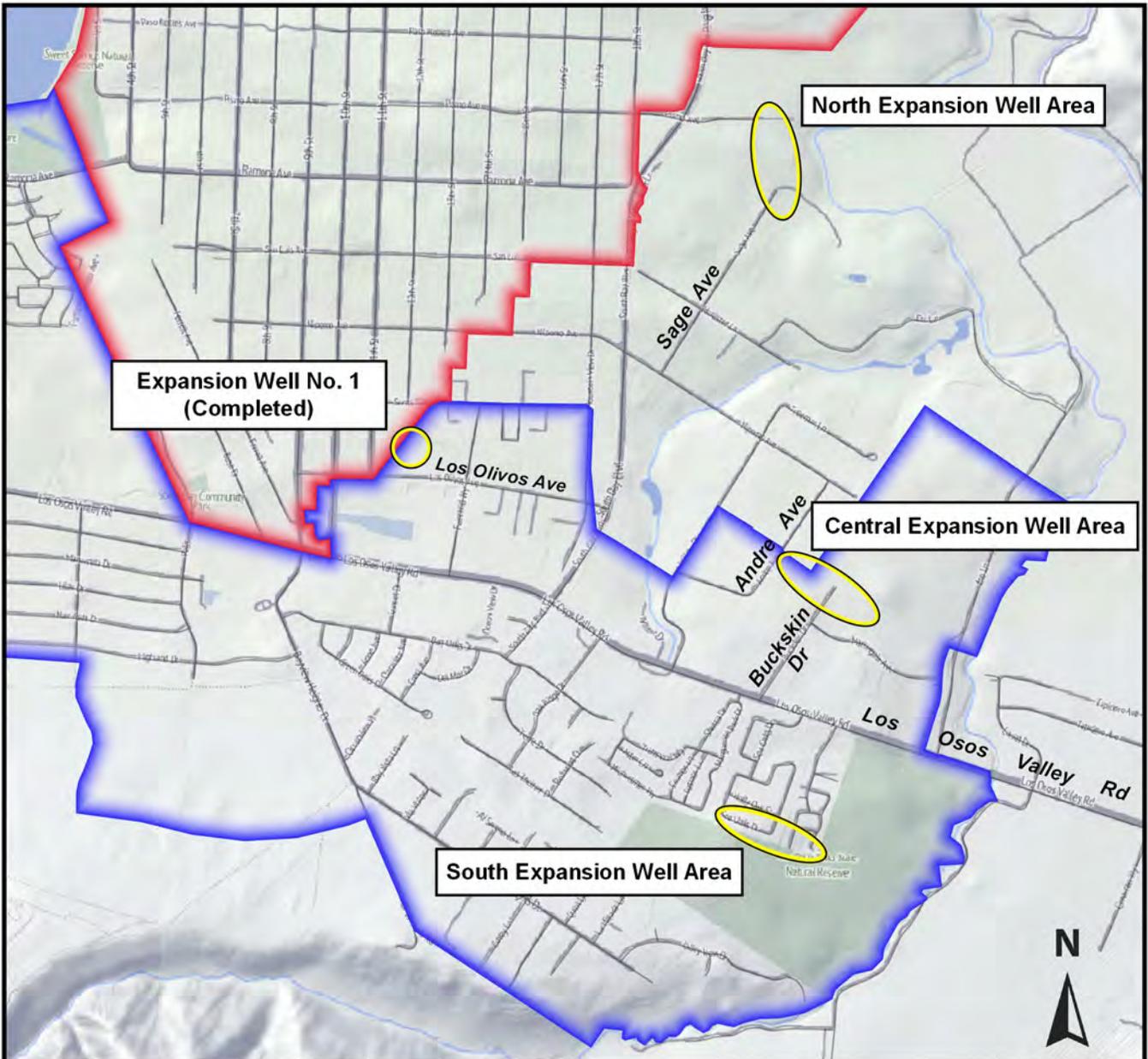
The Program C evaluation for adaptive management considers whether additional Expansion Wells are needed, under current basin water demand, to achieve a Basin Yield Metric targeted value of 80 (BYM 80) or lower, and a distribution of pumping that reverses the historical seawater intrusion trend and maintains a stationary intrusion front at a location closer to the coast in accordance with LOBP goals. The seawater intrusion front for the basin is defined as the 250 mg/L chloride concentration contour.

Basin Metrics

The LOBP established two methods for measuring progress on seawater intrusion mitigation, one based on comparing annual groundwater extractions with the estimated sustainable yield of the basin as calculated by the basin numerical groundwater model, and one based on evaluating water level and water quality data from the Groundwater Monitoring Program. The first method involves the Basin Yield Metric and the Basin Development Metric, while the latter method involves the Water Level Metric, The Chloride Metric, and the Nitrate Metric. A fourth monitoring-based measure, the Water Level Profile, was introduced in the 2017 Annual Groundwater Monitoring Report (CHG, 2018).

The metrics based on groundwater extractions are management tools. The Basin Yield Metric is used for comparing different infrastructure and pumping distribution combinations with respect to seawater intrusion mitigation and sustainable yield. The Basin Development Metric is a representation of the percentage of the Basin's maximum potential sustainable yield that has been developed, and is useful for identifying infrastructure programs needed to meet current and future water demands.

Only the Basin Yield Metric has a nexus with some of the physical metrics based on groundwater monitoring data. Both the Water Level Metric and the Chloride Metric are



Base Image: Stamen-Terrain

0 750 1500 2250 3000 ft



Scale: 1 inch ≈ 1,500 feet

Explanation

 Potential Expansion Well Areas

Water Systems

 Golden State Water Company - Los Osos

 Los Osos CSD

Figure 2
Program C Potential Well Locations
Los Osos Groundwater Basin
2018 Adaptive Management TM

Cleath-Harris Geologists



measures of effectiveness for Lower Aquifer seawater intrusion mitigation, and can be correlated to changes in the Basin Yield Metric. The Basin Development Metric tracks infrastructure program development relative to maximum potential sustainable yield, which does not correlate in real time with changes in groundwater monitoring data.

There is no also correlation between the Basin Yield Metric and the Nitrate Metric. Sustainable yield in the basin is constrained primarily by the need to prevent Lower Aquifer seawater intrusion. Nitrate concentrations in the Upper Aquifer play a major role in basin infrastructure, and are the primary focus of Program B, but the Nitrate Metric itself is independent of Lower Aquifer seawater intrusion mitigation.

Basin Metric Trends Review

Trends in the basin metrics are indicators of whether basin conditions are improving or deteriorating over time, and can be compared to anticipated trendlines for adaptive management. Metric trends from the 2017 Annual Groundwater Monitoring Report are included in Attachment A. Anticipated trendlines for the Water Level Metric, Chloride Metric and Nitrate Metric from the LOBP are included in Attachment B. Note that actual basin metric trends are not expected to follow straight lines, but the trendlines shown in Attachment B are useful to depict the general nature of the anticipated trends.

Basin Yield Metric and Water Level Metric

A comparison between Basin Yield Metric and Water Level Metric trends over time is shown in Figure 3. The Basin Yield Metric compares the actual amount of groundwater extracted in a given year with the sustainable yield of the basin under then-current conditions. For example, the Basin Yield Metric for 2017 is a ratio expressed as follows:

$$\frac{\text{Year 2017 Groundwater Production}}{\text{Year 2017 Sustainable Yield}} * 100$$

A Basin Yield Metric of 100 (BYM 100) indicates that production is equal to the estimated sustainable yield. The LOBP established the Basin Yield Metric target at 80 (BYM 80) or less, so that at least 20 percent of the yield of the basin can be used as a buffer against uncertainty.

As shown in Figure 3, the Basin Yield Metric and the Water Level Metric are closely correlated due to the relationship between groundwater production and water levels. Between 1973 and 1988, a relatively sharp increase in the Basin Yield Metric (and associated groundwater production) is accompanied by a sharp decrease in the Water Level Metric. The trends for both metrics are reversed between 1989 and 2009, with flatter trendline slopes. Between 2009 and 2017 there was a relatively sharp decrease in the Basin Yield Metric (and associated groundwater production), accompanied by a sharp increase in the Water Level Metric.

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Basin Yield Metric and Water Level Metric

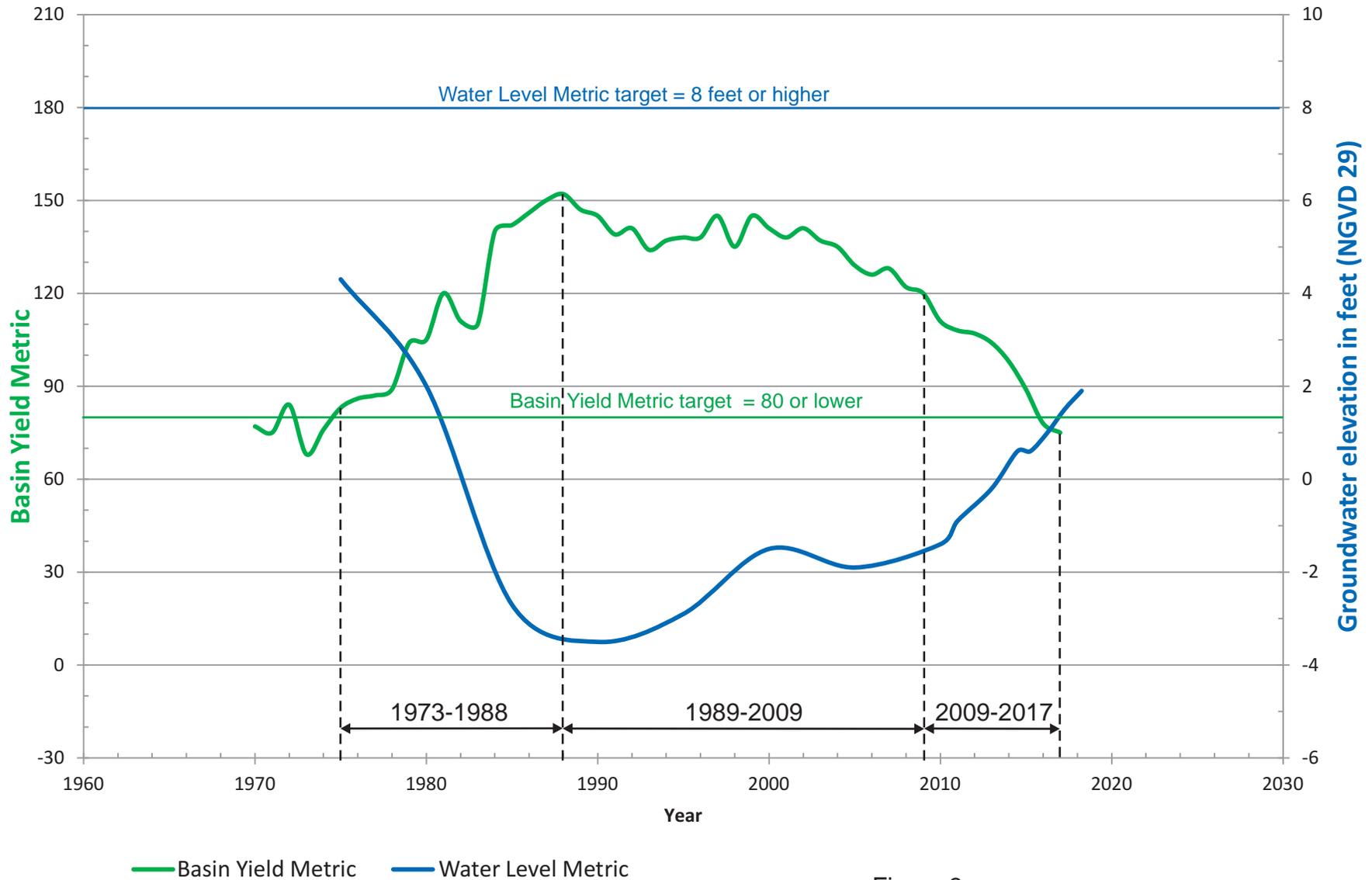


Figure 3
Basin Yield Metric and Water Level Metric
Los Osos Groundwater Basin
2018 Adaptive Management TM

Cleath-Harris Geologists



The anticipated trendline for the Water Level Metric was rising to reach the targeted value of 8 feet above mean sea level within approximately 10 years of achieving the targeted Basin Yield Metric value (LOBP, 2015; Attachment B). The current Water Level Metric trend direction is consistent with the anticipated trend, although the timeline for reaching the target is extended. In Spring 2018, the Water Level Metric measured 1.9 feet elevation, compared to 1.5 feet elevation in Spring 2017 (NGVD 29 datum). If the metric continues to rise at the current rate of approximately 0.4 feet per year, the target threshold of 8 feet above sea mean sea would be reached in 2033, or approximately 18 years after achieving BYM 80.

In 2016, adjustments were made to some of the Water Level Metric well reference point elevations, along with removal of the density correction for water levels on the sandspit, which lowered the Water Level Metric compared to prior calculations. Reevaluation of the metric target is recommended following confirmation of reference point elevations by a licensed surveyor (CHG, 2018).

Basin Yield Metric and Chloride Metric

A comparison between Basin Yield Metric and Chloride Level Metric trends over time is shown in Figure 4. There is a correlation between these two metrics, although it is not as straightforward, compared to the Water Level Metric correlation.

Sustainable yield is the denominator for the Basin Yield Metric calculation. Estimates of sustainable yield are provided by the Basin Model, and are the maximum amount of groundwater that may be extracted from the basin while maintaining a stationary seawater intrusion front, and with no active well producing water with chloride concentrations above 250 milligrams per liter.

If the Basin Yield Metric is above 100, then production exceeds sustainable yield (an overdraft condition), the Chloride Metric rises, and seawater intrusion is projected by the Basin Model to advance inland and impact active drinking water wells. A Basin Yield Metric below 100, however, does not necessarily indicate a sustainable condition, as the distribution of pumping also affects movement of the seawater intrusion front. In other words, the same annual volume of groundwater may be pumped from different aquifers in different locations and would result in the same Basin Yield Metric value for that year, but would not necessarily be equally sustainable.

By 1979, the Basin Yield Metric had exceeded 100, but the Chloride Metric did not respond until almost two decades later, beginning to rise between 1995 and 2000. The reason for the delay is interpreted to be due to the travel time required for seawater intrusion precursors (including steadily increasing chloride concentrations) to reach the metric wells.

The anticipated trendline for the Chloride Metric was a continued rise in the metric up to approximately 220 mg/L chloride, followed by decline, reaching the targeted value of 100 mg/L chloride within approximately 30 years of achieving the targeted Basin Yield Metric value (LOBP, 2015; Attachment B). The current Chloride Metric trend direction is consistent with the

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Basin Yield Metric and Chloride Metric

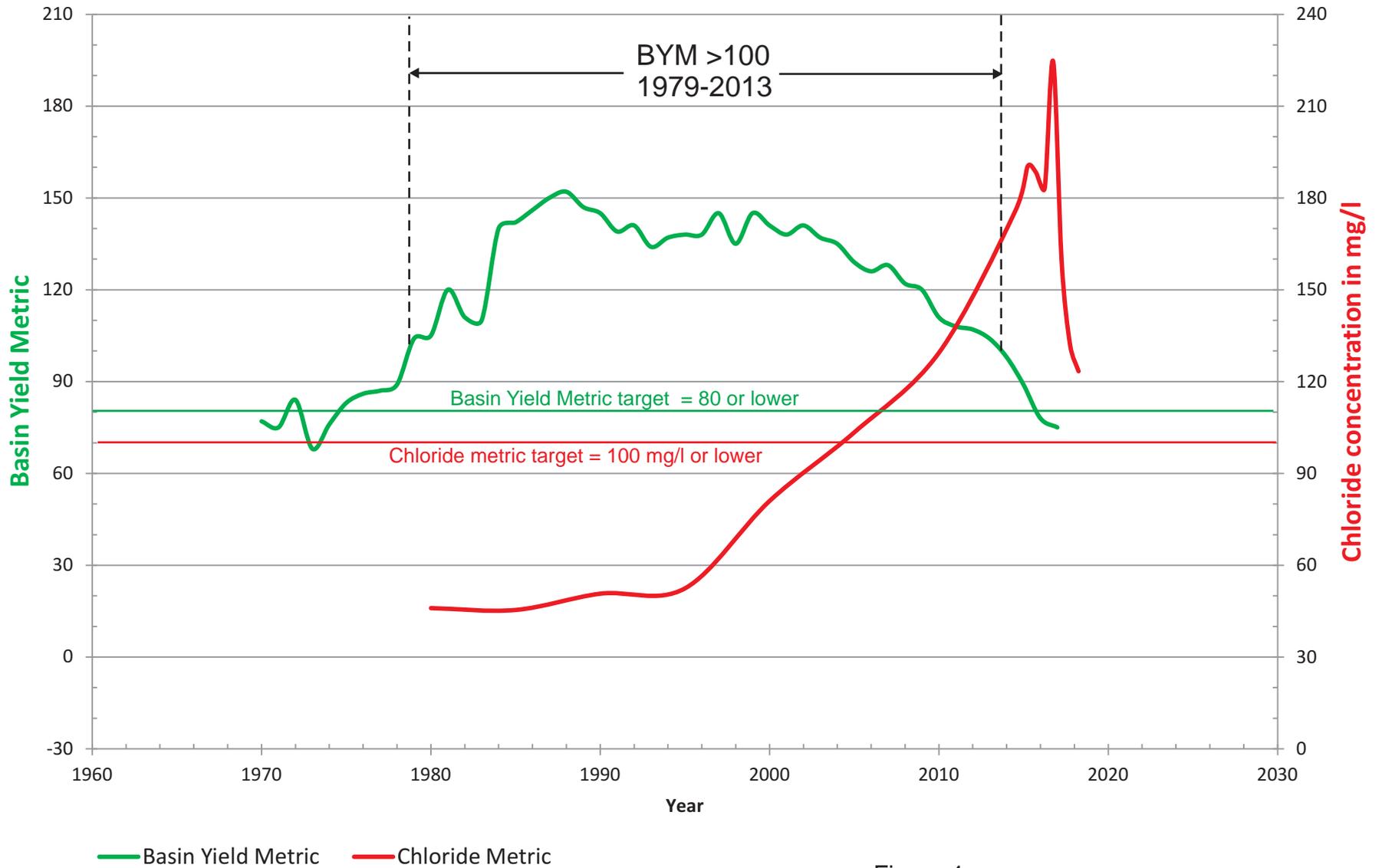


Figure 4
Basin Yield Metric and Chloride Metric
Los Osos Groundwater Basin
2018 Adaptive Management TM

Cleath-Harris Geologists



anticipated trendline, although the timeline for reaching the target is reduced. Chloride Metric values reached a maximum of 225 mg/L chloride in 2016, and have declining to 123 mg/L chloride through Spring 2018. If the metric continues to decline at the current rate of approximately 30 mg/L per year, the targeted value of 100 mg/L chloride or lower would be reached by 2019, approximately 4 years after the Basin Yield Metric moved below the targeted value of BYM 80.

A portion of the recent decline in the Chloride Metric is interpreted to be influenced by wellbore flow from the Upper Aquifer at one of the metric wells, although the majority of chloride concentration decline at the well appears to be occurring in the Lower Aquifer. Further evaluation of Upper Aquifer influence on the Chloride Metric is recommended as new data becomes available (CHG, 2018).

Nitrate Metric

Nitrate Metric trends through 2017 are shown in Figure 22 of the 2017 Annual Groundwater Monitoring Report (Attachment A). The five-year average for metric values increased by approximately 7 mg/L nitrate-nitrogen (NO₃-N) between 2002-2006 and 2013-2017. Individual year metric values reached 32 mg/L NO₃-N in 2017, over three times the Maximum Contaminant Level of 10 mg/L (the drinking water standard).

Elevated Nitrate concentrations in the urban area are attributable to historical wastewater discharges to high-density septic systems (LOBP, 2015), which are now conveyed to the Los Osos Wastewater Recycling Facility (LOWRF) for treatment and disposal. Recycled water being delivered to community leach field disposal sites from LOWRF contains approximately 2 mg/L total nitrogen, based on a 30-day average concentration reported for September 2017 (CHG, 2018).

The anticipated trendline for the Nitrate Metric was for values to remain stable through 2020, followed by a gradual decline, and reaching the targeted metric value of 10 mg/L by 2050 (Attachment B). The current Nitrate Metric trend is inconsistent with the anticipated trend, although a shift in the nitrate monitoring schedule may have influenced the 2016 and 2017 Nitrate Metric results and increased the metric compared to prior years (CHG, 2018).

Nitrate removal systems are in place at two locations, and provisions for additional nitrate removal capacity are planned during Upper Aquifer development under Program B. More time is needed for observing the effects of decreased nitrate loading to the basin under current conditions with the Los Osos Wastewater Project completed.

Infrastructure Program C Evaluation

The Program C evaluation for adaptive management considers whether additional Expansion Wells under LOBP Program C are needed, under current basin water demand, to achieve both a



Basin Yield Metric target value of 80 (BYM 80) or lower, and a distribution of pumping that maintains a stationary seawater intrusion front closer the coast, similar to the position shown in LOBP Figure 38 (Attachment B). Program C calls for three expansion wells to be constructed to meet the LOBP goals of halting or reversing seawater intrusion and providing a sustainable water supply under the existing population scenario. Basin water demand for the existing population scenario was originally estimated at 2,230 AFY (Table 46 of the LOBP; ISJ, 2015). The updated existing population scenario assumes a water demand of 2,070 AFY, based on the estimated basin water use in 2017 (CHG, 2018).

2017 Basin Yield Metric

Water supply infrastructure at year-end 2017 included the following LOBP elements:

- Los Osos Wastewater Project
- Urban Water Reinvestment Program (U)
- Infrastructure Program A
- Partial completion of infrastructure Program C

The sustainable yield of program combination U+A is 2,650 acre-feet per year (AFY), as reported in Table 43 of the LOBP (ISJ, 2015). Program C was partially completed in 2016 with the construction of Expansion Well No. 1 by GSWC at Los Olivos Avenue (Figure 2). The contribution of Program C to basin sustainable yield is the difference between the yield of program combination U+A (2,650 AFY) and program combination U+AC (3,000 AFY), which is 350 AFY. Close to one-third, or an estimated 110 AFY of the sustainable yield contribution from Program C was developed in 2016, bringing the total estimated sustainable yield for year-end 2017 conditions to 2,760 AFY (CHG, 2017; 2018).

Groundwater production in 2017 was estimated at 2,070 acre-feet, including 1,050 acre-feet of community purveyor production and 1,020 acre-feet of other production (golf course, community park, memorial park, non-purveyor domestic, and agriculture). The corresponding Basin Yield Metric for 2017 was 75, which met the LOBP target of BMV 80 or less for the second consecutive year (CHG, 2018).

Program C Evaluation

Basin Model results indicate no additional Expansion Wells would be required under the existing population scenario, based on the current basin water demand of 2,070 AFY, to achieve both a Basin Yield Metric targeted value of 80 (BYM 80) and a stationary seawater intrusion front closer the coast. The current 2017 Basin Yield Metric is 75, which meets the targeted value. A stationary seawater front can also be maintained at a position closer to the coast with the existing Expansion Well, assuming long-term precipitation averages 17.5 inches per year. There are other factors, however, which support construction of an additional Program C Expansion Well. These include water system reliability, drought impacts, and recycled water distribution.



Water System Reliability

Each purveyor well has a maximum annual production potential, based on historical performance and pumping tests. Nine of the 14 active purveyor wells are simulated to be pumping at maximum capacity in the Basin Model under the sustainable yield scenario for 2017 conditions. Some of the wells may need rehabilitation and other water system improvements may be required to provide the maximum capacity assumed in sustainable yield scenarios. For example, the LOCSD South Bay site has two supply wells, but needs a dedicated water supply main to the District's main pressure zone to convey the full capacity that the two wells are capable of. Municipal supply wells will also eventually require replacement, and not all of the well sites may be suitable for drilling a new well, such as the LOCSD 3rd Street site. A second Expansion Well would provide greater system redundancy and flexibility for adjusting the pumping distribution, should any of the existing wells lose full capacity.

Drought Impacts

The recent exceptional drought (2012-2016) demonstrated that seawater intrusion can occur with a basin yield metric below BYM 100. The Chloride Metric continued to increase overall between 2012 and 2016, despite the Basin Yield Metric dropping below 100 in 2013, and below 80 in 2016 (Figure 4). Similar to the water reliability benefit, a second Expansion Well would provide greater flexibility for adjusting the pumping distribution, should any of the wells become temporarily impacted by seawater intrusion during exceptional drought.

Recycled Water Distribution

Recycled water flow from the Los Osos Water Recycling Facility (LOWRF) is estimated to be 580 AFY under the updated existing population scenario, which is 200 AFY less than anticipated (LOBP Table 32; ISJ, 2015). As a result, there is currently insufficient recycled water for all the reuse projects identified in the Urban Water Reinvestment Program.

Evaluation of seawater intrusion mitigation during prior studies have ranked various recycled water uses in terms of seawater intrusion mitigation and associated benefit to basin sustainable yield (Carollo Engineers, 2007; CHG, 2014). The ranking, from highest level of mitigation to lowest, is summarized as follows:

- 1) Urban reuse or agricultural exchange (equal benefit)
- 2) Broderson community leachfield
- 3) Agricultural reuse with in-lieu recharge (Eastern Area)
- 4) Los Osos Creek recharge
- 5) Agricultural reuse without exchange or in-lieu recharge (Eastern Area)
- 6) Spray fields or agricultural reuse out of Basin.

Agricultural exchange involves offsetting agricultural pumping with recycled water, combined with an equal amount of pumping from infrastructure Program D wells (Los Osos Creek valley



wells; not currently being considered). Agricultural reuse with in-lieu recharge is just offsetting agricultural pumping with recycled water use, without Program D wells.

Program C wells can improve the potential seawater intrusion mitigation benefit and purveyor yield from agricultural reuse with in-lieu recharge. For example, with the 2017 infrastructure in place, shifting recycled water from Broderson leachfield disposal to agricultural reuse with in-lieu recharge results in an estimated loss in purveyor yield of approximately 30 percent of the amount shifted. With a new Program C well, the loss in purveyor yield is reduced to an estimated 10 percent of the amount shifted. A new Program C well increases the ability of purveyors to capture any future in-lieu recharge occurring in the Los Osos Creek Valley.

Pumping Distribution and Basin Yield under Program C

The Basin Model is a tool to assist with the understanding of basin dynamics and to compare different pumping distributions for maximizing yield while mitigating seawater intrusion. General guidelines for optimizing the pumping distribution include the following:

- Maximize Upper Aquifer production (nitrate removal or blending may be required). Implementing infrastructure Program B meets this guideline.
- Shift Lower Aquifer production away from the coast. Implementing Program C meets this guideline.

The basin sustainable yield with three Program C wells completed was estimated at 3,000 AFY (ISJ, 2015). With Expansion Well No. 1 completed, the estimated sustainable yield for 2017 is 2,760 AFY (CHG, 2018). The Basin Model has been used to estimate the increased sustainable yield with a new program C well in each of the potential areas shown in Figure 2. Results are summarized below in Table 1.

Table 1 - Program C Sustainable Yield Estimates		
Program C Description	Estimated Sustainable Yield	Increase over 2017
	Acre-Feet per Year	
2017 Infrastructure (Expansion Well No. 1)	2,760	0
Add Expansion Well No. 2 in North Area	2,850	90
Add Expansion Well No. 2 in Central Area	2,900	140
Add Expansion Well No. 2 in South Area	2,950	190
Maximum for Program C (add two wells)	3,000	240



As shown in Table 1, constructing Expansion Well No. 2 in the south area would potentially add the greatest amount of sustainable yield (190 AFY), followed by the Central area 4 (140 AFY), and the north area (90 AFY). A combination of two new Expansion Wells (south and central areas or south and north areas) would potentially add an estimated 240 AFY of sustainable yield.

Conclusions and Recommendations

The following conclusions were reached during the basin metric review and Program C evaluation:

- Expectations are generally being met when comparing Water Level Metric and Chloride Metric trends to the anticipated trends. Both metrics are trending in the direction of improvement, as anticipated. The Water Level Metric trend is projected to reach the targeted value later than anticipated, however, while the Chloride Metric is anticipated to reach the targeted value sooner than anticipated.
- Expectations are not being met when comparing the Nitrate Metric trend to the anticipated trend. The Nitrate Metric is not improving, but is deteriorating. More time is needed for observing the effects of decreased nitrate loading to the basin under current conditions with the Los Osos Wastewater Project completed.
- No additional Program C wells are needed under the updated existing population scenario to achieve a Basin Yield Metric below 80 and a distribution of pumping that maintains a stationary seawater intrusion front closer to the coast. There are other considerations, however, that would support adding one additional Program C well, including water system reliability, drought protection, and recycled water reuse.
- The potential increases in sustainable yield from the addition of one new Program C Expansion Well are estimated to be 90 AFY in the north area, 140 AFY in the central area, and 190 AFY in the south area. The addition of two new Program C wells could potentially add an estimated 240 AFY of sustainable yield.

The following adaptive management recommendations are based on the above conclusions:

- No adjustments to the LOBP are recommended in response to the metric trends review. Although the Nitrate Metric is not meeting expectations, nitrate removal systems are in place and there are provisions for additional nitrate removal for Upper Aquifer development under Program B. It is also too early to observe the effects of decreased nitrate loading to the basin under Los Osos Wastewater Project conditions.
- A reduction in infrastructure Program C from three Expansion Wells to two Expansion Wells is recommended to meet LOBP objectives for the updated existing population



scenario. One of the Expansion Wells has been completed, so only one additional well would be needed, rather than two more per the current LOBP.

References

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<http://www.slocountywater.org/site/Water%20Resources/LosOsos/pdf/TM%20Basin%20Yield%20Metric%20Los%20Osos%20GW%20Basin%2020170303.pdf>

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<http://www.slocountywater.org/site/Water%20Resources/LosOsos/pdf/2017%20Annual%20Report%20Final.pdf>

ISJ Group, 2015, Updated Basin Plan for the Los Osos Groundwater Basin, January 2015.

<http://www.slocountywater.org/site/Water%20Resources/LosOsos/pdf/Los%20Osos%20Groundwater%20Basin%20Plan%20January%202016.pdf>



ATTACHMENTS



ATTACHMENT A:

Basin Metric Trends
2017 Annual Groundwater Monitoring Report

Chloride and Water Level Metric Lower Aquifer

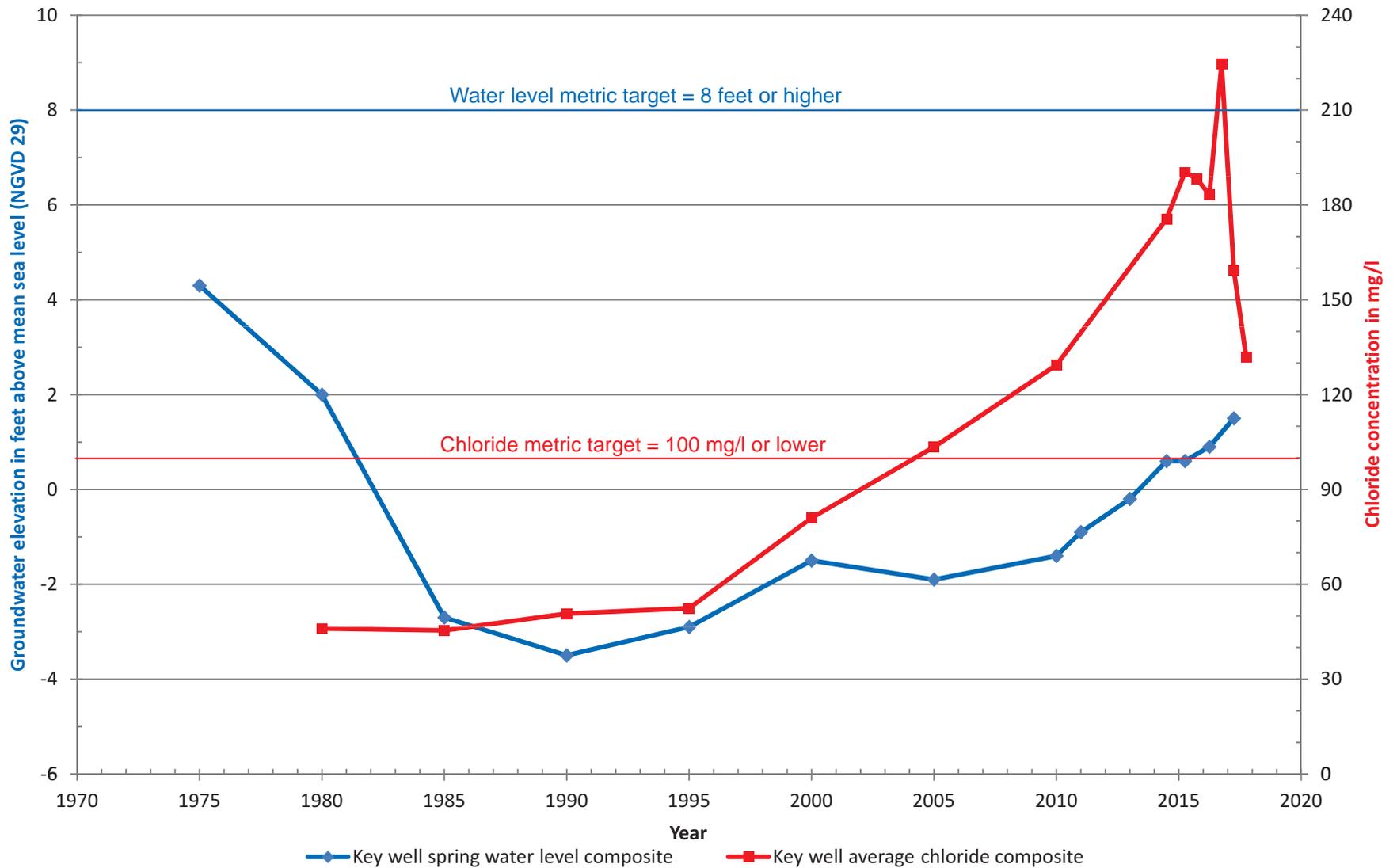
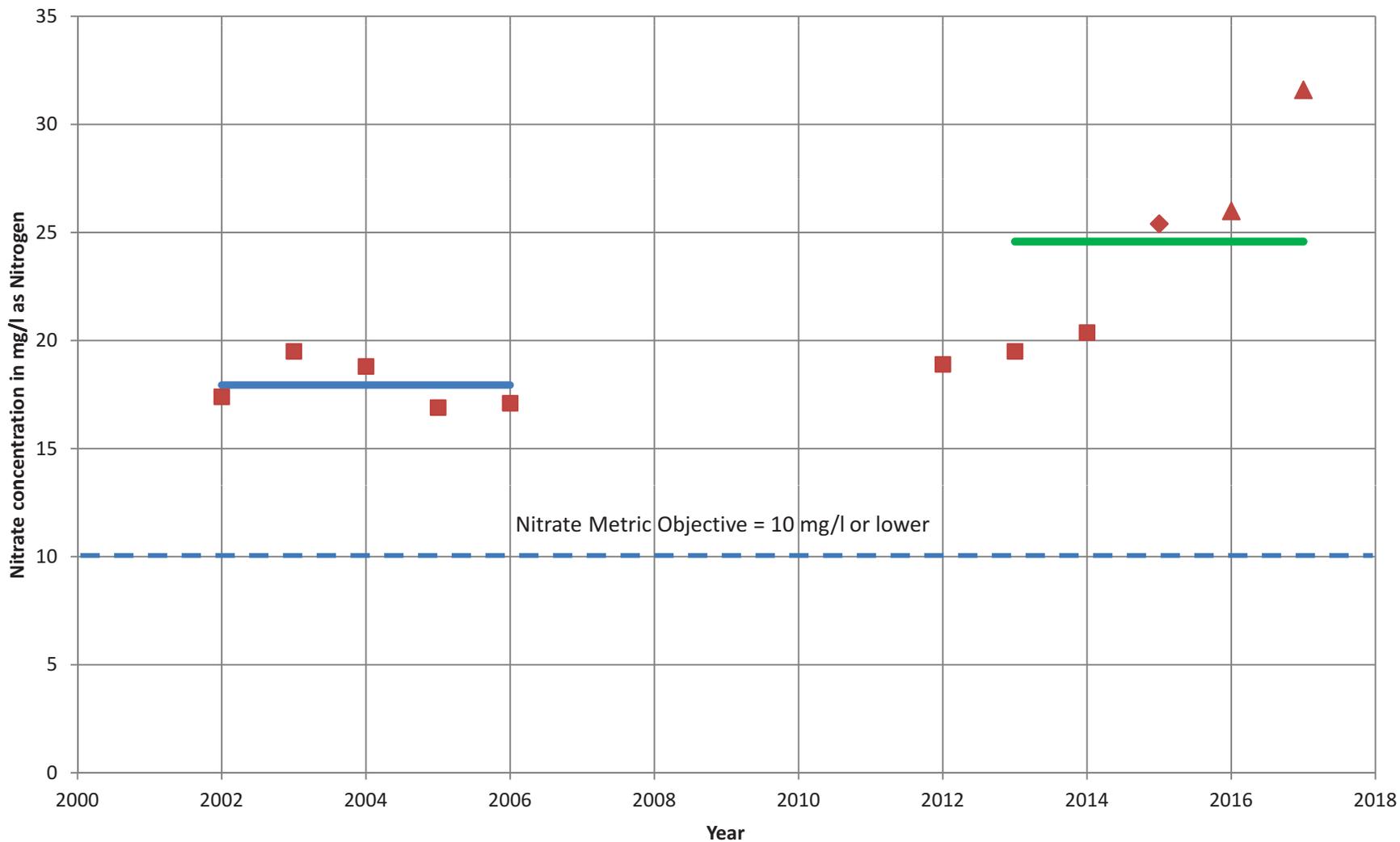


Figure 21
Chloride and Water Level Metric
Los Osos Groundwater Basin
2017 Annual Report

Reference: 2017 Annual Groundwater Monitoring Report (CHG, 2018)

Cleath-Harris Geologists

Nitrate Metric First Water



- Key well composite (Average of seasonal data)
- ◆ Key well composite (Fall sampling schedule in 2015)
- ▲ Key well composite (Winter sampling schedule beginning 2016)
- 2002-2006 average — 2013-2017 average

NOTE: Nitrate metric plots for 2013 and 2014 corrected to apply January 2014 data set to Winter 2013 season.

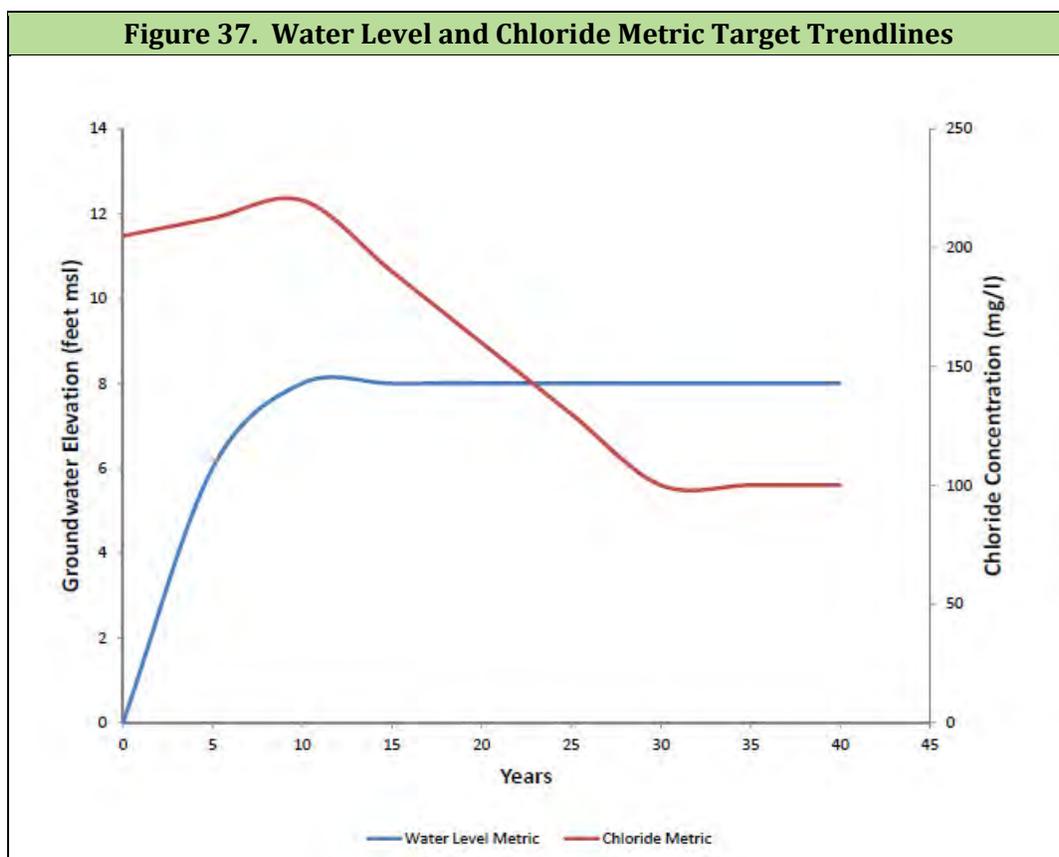
Figure 22
Nitrate Metric
Los Osos Groundwater Basin
2017 Annual Report

Cleath-Harris Geologists



ATTACHMENT B

Anticipated Metric Trends
Predicted Seawater Intrusion for Basin Metric Targets
2015 Los Osos Groundwater Basin Plan Update



Based on the actions recommended in this Basin Plan, the Model predicts that the freshwater-seawater interface will be pushed seaward from its current location to that shown in Figure 38. As seen on that map, a Basin Yield Metric of 100 would maintain seawater intrusion (250 mg/l) at an equilibrium line underneath the landed portion of the Basin. This Basin Plan does not recommend allowing seawater intrusion to remain in the Basin to that extent, but rather to reverse the present location of seawater in the Basin (see Figure 26) to a position further seaward. In order to attain seawater intrusion at the seaward position, the Parties would need to achieve a Basin Yield Metric of 80 or below. Maintaining a buffer of 20 percent would shift seawater intrusion to a more favorable location than simply achieving a Basin Yield Metric of 100.

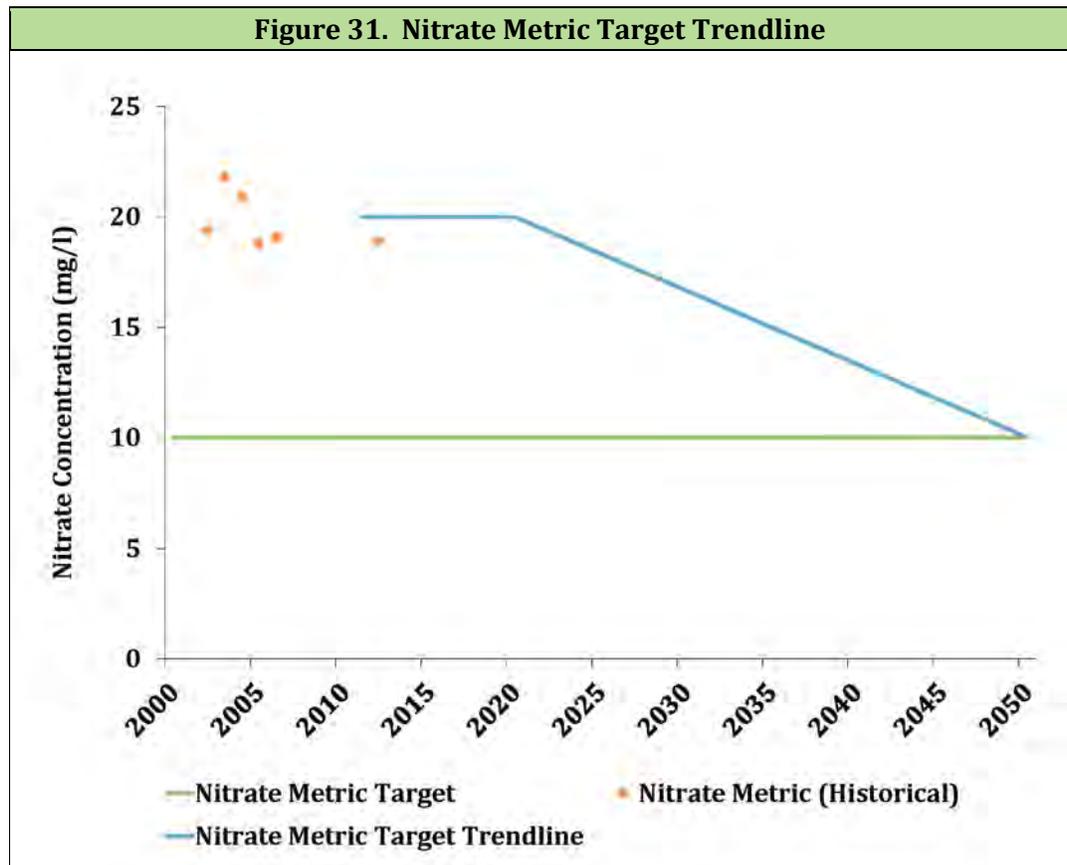
6.4 The Challenge of Uncertainty

The prior sections of this chapter have addressed the two greatest threats to the Basin, namely, nitrate impacts to the Upper Aquifer and seawater intrusion into the Lower Aquifer. Those sections establish metrics for evaluating the twin threats and actions that will be taken to defend against them. In addition to past and present threats, however, there are also potential future threats. Future threats are particularly challenging to address because of their inherent uncertainty. Because these threats share that common condition, they are analyzed together as the single threat of uncertainty. Several sources of uncertainty are discussed below.

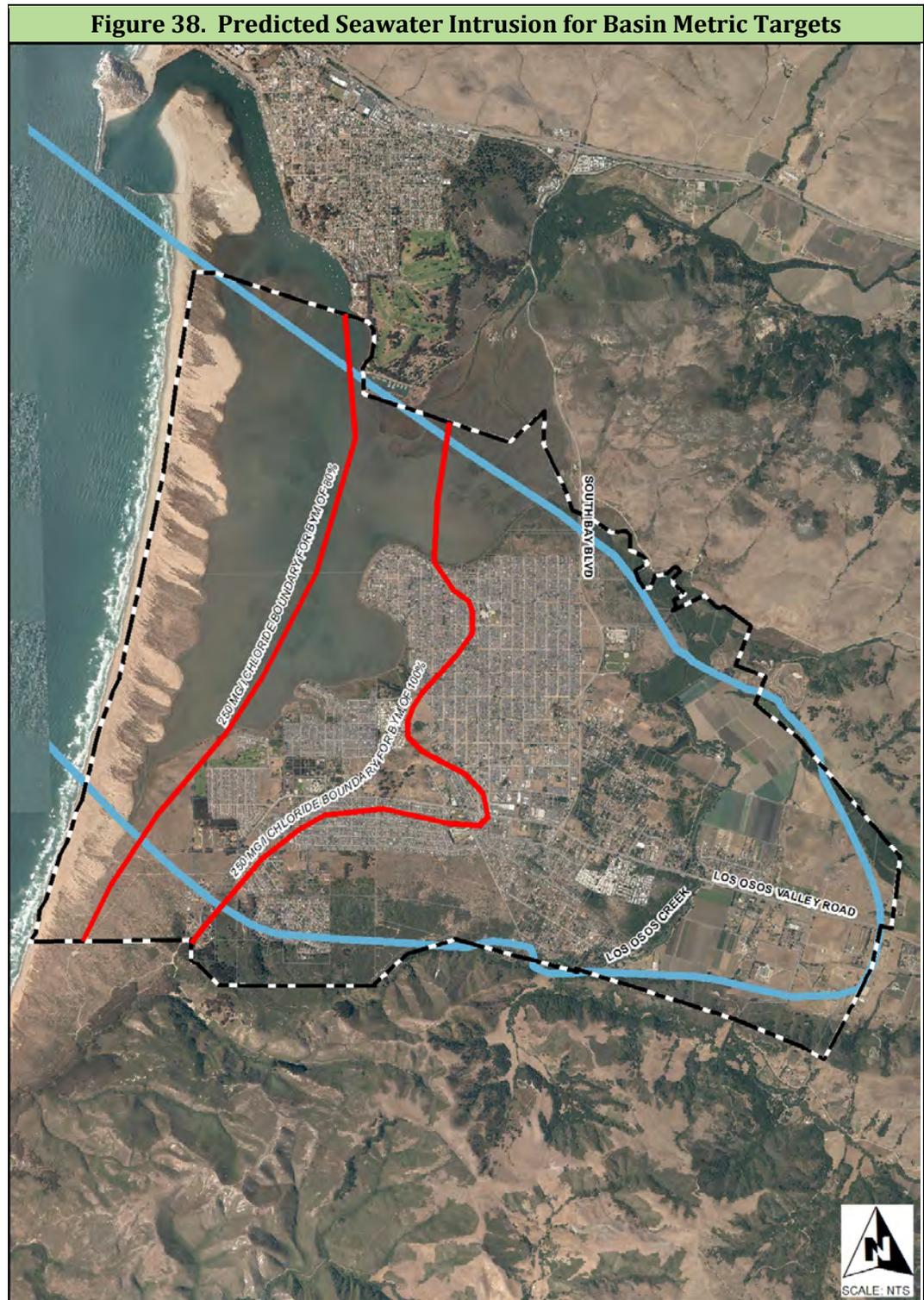
reducing the overall quantity of nitrate in the Basin. Nitrate removal facilities are components of the Basin Infrastructure Program set forth in Chapter 10.

Lastly, through the Basin Management Committee, the Parties will implement the Wellhead Protection Program set forth in Chapter 13. That program will ensure proper construction of new wells and abandonment of existing wells to prevent further impacts to either the Upper Aquifer or Lower Aquifer.

It is likely to take approximately 30 years for the Upper Aquifer to equilibrate to a change in nitrate loading, although the Nitrate Metric Target can potentially be achieved within a shorter time frame.⁵⁴ In the intervening years, nitrate removal or blending with other sources with lower nitrate levels will be required for extensive use of the Upper Aquifer as a source of drinking water. Figure 31 depicts a Nitrate Metric Target Trendline that will be used to measure progress toward the ultimate Nitrate Metric Target of 10 mg/l. The Parties will periodically evaluate the progress of the Nitrate Metric in relation to the trendline in Figure 31 in order to determine whether actions taken in the Basin are having the desired impacts on nitrate levels.



⁵⁴ See Yates & Williams, *Simulated Effects of a Proposed Sewer Project on Nitrate Concentrations in the Los Osos Valley Groundwater Basin* (2003).





December 7, 2018

Rob Miller
Interim Executive Director
Los Osos Groundwater Basin Management Committee

Re: Draft Los Osos Basin Plan Metric Trends Review Report

President
Vicki L. Milledge

Vice President
Marshall E. Ochylski

Directors
Charles L. Cesena
Matthew D. Fourcroy
Christine M. Womack

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Dear Rob,

The Los Osos Community Services District (LOCSD) Utilities Advisory Committee offers the following comments and suggestions regarding the above referenced August 17, 2018 Draft Technical Memorandum (revised as of 8-27-18):

1. Near the bottom of Page 1 the memo states, "Groundwater production from the Central Area generally results in less seawater intrusion than the same amount of production from the Western Area, which increases the sustainable yield of the Basin." This is the rationale behind the Basin Management Plan's (BMP) Program C Expansion Well program. As you know, the next step in that program is the LOCSD's current search for a new well location east of South Bay Boulevard, over the Central Area of the Basin.

2. Recent public input indicates that increasing the Basin's sustainable yield through an adaptable pumping program that would include an additional well in the Central Area of the basin will be controversial.

a. Perhaps this is understandable given that under the Program C Evaluation discussion on Page 6, the memo states that "Basin Model results indicate that no additional Expansion Wells would be required under the existing population scenario to achieve both a Basin Yield Metric targeted value of 80 (BYM 80) and a stationary seawater intrusion front."

Granted there are references to other factors which support construction of an additional Program C Expansion Well, the most important of which may be the Page 6 assumption that long-term precipitation averages 17.5 inches per year in the future.

b. We wonder if the discussion of the other factors supporting the additional Expansion Well (water system flexibility-reliability and the efficient use of recycled water) could be enhanced. The key to this understanding seems to be found in the third paragraph of Page 4's discussion of the Basin Yield Metric and Chloride Metric, where it is stated that "...the same annual volume of groundwater may be pumped from different aquifers in different locations and would result in the same Basin Metric Yield value for that year, but would not necessarily be equally sustainable."

3. The memo refers to Tables 46 and 32 of the Basin Plan on pages 6 and 7 of the memo.

a. The document did not include the Tables in an Attachment.

4. The Recycled Water Distribution discussion on Page 7 should include the mitigation factors for each of the 6 reuse strategies.

We understand that this is a very technical discussion, yet it is paramount that the community be able to understand the benefits to construction of the additional well in the Central Area of the basin and particularly how the adaptive pumping allowed by the varied pumping locations will help maximize the Basin's sustainable yield.

Thank you for your consideration of these comments.

Sincerely,



Chuck Cesena
Chairperson, LOCSD Utilities Advisory Committee

TO: Los Osos Basin Management Committee

FROM: Rob Miller, Interim Executive Director

DATE: January 16, 2019

SUBJECT: Item 7b – Adoption of Basin Management Committee Annual Budget

Recommendations

Staff recommends that the Committee adopt the Calendar Year 2019 budget as drafted.

Discussion

Section 5.13.2 of the Stipulated Judgment requires that the parties develop an annual budget to fund its activities. Staff has prepared a draft budget (attached), which includes the following key items:

- Basin Management Committee general administration for Calendar Year 2019, including venue and meeting expenses. In general, these items were within budget in 2018.
- Similar to 2018, a budget line item has been included for adaptive management studies if requested by the Committee. This item also includes \$5,000 for well head surveying as recommended in the draft 2019 Work Plan, which was considered by the BMC at the November 2018 meeting.
- Consultant services for the preparation of the 2018 Annual Report, including monitoring. Note that the total cost of items 5 and 6 total \$62,700. This allocation is similar to 2018, with a 12% increase to account for additional technical analysis in response to comments from the last annual report.
- Consultant services to assist in the pursuit of grants
- Additional studies regarding recycled water recharge in Los Osos Creek as recommended in the draft 2019 Work Plan
- Installation of a new monitoring well in Cuesta by the Sea, which was carried over from 2018.
- Jointly pursued water conservation efforts, including sufficient funding for a pilot program for septic tank repurposing.
- Feasibility study for stormwater and perched water recovery as indicated in draft 2019 Work Plan.

Given that the parties operate on different fiscal calendars, staff believes a standard calendar year to be the appropriate budget interval. The total recommended budget for 2019 is approximately 17% more than 2018. However, the monitoring well budget for 2018 was rolled over into 2019 in the amount of \$115,000. If the monitoring well budget had been expended in 2018, the proposed 2019 budget would have been reduced to less than the 2018 budget.

Financial Considerations

The total budget proposed for 2019 is \$346,200. The budget also includes a 5% contingency for unforeseen expenses. The estimated cost to each party is summarized as follows:

LOCSD (38%): \$131,556

GSWC (38%): \$131,556

County of SLO (20%): \$69,240

S&T Mutual (4%): \$13,848

Table 1: BMC 2019 Budget for 12 month period, allocated by fiscal year

Item	Description	Cost	Projected Total in LOCS D FY 2018/19	Projected Total in LOCS D FY 2019/20	Comments
1	Monthly meeting administration, including preparation, staff notes, and attendance	\$50,000	\$25,000	\$25,000	Assumes 20 to 25 hours per month, on average
2	Meeting expenses - facility rent (if SBCC needed for larger venue)	\$1,000	\$500	\$500	\$30/hr for non-profit
3	Meeting expenses - audio and video services	\$6,000	\$3,000	\$3,000	
4	Adaptive Management - Groundwater Modeling and Well Head Surveying	\$15,000	\$10,000	\$5,000	Includes \$5k for surveying, and the remainder represents modeling studies as requested and approved by BMC
5	Semi annual seawater intrusion monitoring	\$29,200	\$14,600	\$14,600	
6	2018 Annual Report	\$33,500	\$28,000	\$5,500	Not including services contributed directly from BMC member staff
7	Grant writing (outside consultant)	\$5,000	\$3,000	\$2,000	BMC member staff may also contribute to grant efforts
8	Creek Recharge and Replenishment Studies	\$50,000	\$15,000	\$35,000	Grant pursuit, additional baseline modeling
9	Cuesta by the Sea monitoring well	\$115,000	\$40,000	\$75,000	Well ownership to be determined prior to construction
10	Stormwater and Perched Water Recovery Project - Feasibility Study	\$15,000	\$5,000	\$10,000	
11	Conservation programs (not including member programs)	\$10,000	\$5,000	\$5,000	Consider pilot program for septic tank conversion rebates
	Subtotal	\$329,700			
	5% Contingency (rounded to nearest \$100)	\$16,500	\$8,300	\$8,200	
	Total	\$346,200	\$157,400	\$188,800	
	LOCS D (38%)	\$131,556	\$59,812	\$71,744	
	GSWC (38%)	\$131,556			
	County of SLO (20%)	\$69,240	\$31,480	\$37,760	
	S&T Mutual (4%)	\$13,848			

TO: Los Osos Basin Management Committee

FROM: Rob Miller, Interim Executive Director

DATE: January 16, 2019

SUBJECT: Item 7e: Approval of Proposals for Hydrogeologic Services for Calendar Year 2019, to be provided by Cleath Harris Geologists

Recommendations

Staff recommends that the Committee approve the proposed scope and fee for hydrogeologic services for calendar year 2019, to be provided by Cleath Harris Geologists, in an amount not to exceed \$62,700, and contingent on the approval of the 2019 budget by the Committee (Agenda Item 7d) and approval of the 2019 BMC budget by each of the member Boards.

Discussion

Item 7d on this month's agenda discusses the working budget for the calendar year 2019 BMC Committee. The budget included the following two line items that relate to groundwater monitoring:

- Budget Item 5: Annual seawater intrusion monitoring: \$29,200
- Budget Item 6: Annual report: \$33,500
- Total: \$62,700

The above two items are addressed in the attached proposals from Cleath Harris Geologists (CHG). The annual monitoring will be completed per the Basin Plan monitoring schedule (April and October). The Draft Annual Report will be completed in approximately 4 months from Notice to Proceed. While the Committee may choose to consider the proposals separately, staff is recommending that both be approved concurrently, and if approved, a single contract would be prepared for the work, similar to last year.

Notice to Proceed will be contingent on the Approval of Agenda Item 7d and approval of the BMC Committee budget by each of the member agencies. Once each of the member agencies approves the budget, Notice to Proceed will be provided to Cleath Harris Geologists.

Financial Considerations

The draft Committee budget for calendar year 2019 includes specific line items for the proposed work as described above.



January 4, 2019

Los Osos Basin Management Committee
c/o Mr. Rob Miller, P.E.
Wallace Group
612 Clarion Court
San Luis Obispo, CA 93402

SUBJECT: Proposal for 2018 Annual Monitoring Report for the Los Osos Groundwater Basin.

Dear Mr. Miller:

Cleath-Harris Geologists (CHG) proposes to perform hydrogeologic services related to completing the 2018 Annual Monitoring Report for the Los Osos Basin Plan (LOBP) Groundwater Monitoring Program. This proposal presents a scope of work, schedule, and the estimated costs for these services.

Scope of Work

The scope of work has been separated into annual report tasks and additional studies. The additional studies address specific recommendations or comments based on the prior year reporting. The purpose of separating the tasks is to assist with budget projections.

Annual report tasks include:

- Update databases with 2018 groundwater level and quality data for LOBP monitoring network wells.
- Prepare the draft 2018 Annual Monitoring Report for Basin Management Committee (BMC) review. The report will include data reporting and interpretation for the period from January 1 through December 31, 2018. The report shall follow the 2017 Annual Monitoring Report format as a template, with updates to content for changed conditions, including an Upper Aquifer Water Level Profile and a soil-moisture budget for agricultural water use estimates.
- Receive BMC comments and incorporate into a final 2018 Annual Monitoring Report.
- Assist BMC with preparing CASGEM datasets.



Tasks for additional studies associated with prior year recommendations and comments include:

- Develop specific yield values for individual aquifers to improve groundwater storage estimates.
- Further evaluation of wellbore flow and Upper Aquifer influence at LA10 using 2018 water quality results.

Schedule

The draft report will require approximately four months to complete. The final report would be available approximately 3-4 weeks following receipt of BMC comments.

Fees and Conditions

CHG proposed to perform the above scope of work on an hourly rate plus expenses basis in accordance with the attached terms of fees and conditions and the hourly rate schedule listed below. The estimated cost for hydrogeologic services to complete annual tasks is estimated at \$30,000, and to complete one-time tasks is \$3,500; total costs for 2018 Annual Report preparations is **\$33,500**.



SCHEDULE OF HOURLY RATES

Principal Hydrogeologist	\$ 160
Senior Hydrogeologist	\$ 150
Project Geologist	\$ 135
Environmental Scientist	\$ 120
GIS Specialist	\$ 120
Staff Geologist Level II	\$ 120
Staff Geologist Level I	\$ 100

EXPENSES

Mileage \$0.54/mile
Other expenses at cost plus 10 percent handling.

If the herein described work scope, fees and conditions are acceptable, this proposal will serve as the basis for agreement.

Cleath-Harris Geologists, Inc.

Spencer J. Harris, Vice President



SCHEDULE OF FEES AND CONDITIONS

- Invoices will be submitted monthly. The invoice is due and payable upon receipt.
- In order to defray carrying charges resulting from delayed payments, simple interest at the rate of ten percent (10%) per annum (but not to exceed the maximum rate allowed by law) will be added to the unpaid balance of each invoice. The interest period shall commence 30 days after date of original invoice and shall terminate upon date of payment. Payments will be first credited to interest and then to principle. No interest charge would be added during the initial 30 day period following date of invoice.
- The fee for services will be based on current hourly rates for specific classifications and expenses. Hourly rates and expenses included in the attached schedule are reevaluated on January 1 and July 1 of each year.
- Documents including tracings, maps, and other original documents as instruments of service are and shall remain properties of the consultant except where by law or precedent these documents become public property.
- If any portion of the work is terminated by the client, then the provisions of this Schedule of Fees and Conditions in regard to compensation and payment shall apply insofar as possible to that portion of the work not terminated or abandoned. If said termination occurs prior to completion of any phase of the project, the fee for services performed during such phase shall be based on the consultant's reasonable estimate of the portion of such phase completed prior to said termination, plus a reasonable amount to reimburse consultant for termination costs.
- If either party becomes involved in litigation arising out of this contract or the performance thereof, the court in such litigation shall award reasonable costs and expenses, including attorney's fees, to the party justly entitled thereto. In awarding attorney's fees the court shall not be bound by any court fee schedule, but shall, if it is in the interest of justice to do so, award the full amount of costs, expenses, and attorney's fees paid or incurred in good faith.
- All of the terms, conditions and provisions hereof shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns, provided, however, that no assignment of the contract shall be made without written consent of the parties to the agreement.



January 4, 2019

Los Osos Basin Management Committee
c/o Mr. Rob Miller, P.E.
Wallace Group
612 Clarion Court
San Luis Obispo, CA 93402

SUBJECT: Proposal for Los Osos Basin Plan 2019 Groundwater Monitoring.

Dear Mr. Miller:

Cleath-Harris Geologists (CHG) proposes to provide hydrogeologic services related to groundwater monitoring for the Los Osos Basin Plan (LOBP). This proposal describes existing monitoring data collection and presents a scope of work, schedule, and the estimated costs for hydrogeologic services to complete the semi-annual LOBP monitoring program recommendations, including semi-annual seawater intrusion monitoring.

Background

The groundwater monitoring program in Chapter 7 of the LOBP includes 73 monitoring well locations within the basin. Fifteen additional wells with monitoring data have been added to the LOBP network.

There are two existing, ongoing monitoring programs that historically overlapped with the LOBP monitoring program: the San Luis Obispo County Water Level Monitoring Program and the Los Osos Water Recycling Facility (LOWRF) Groundwater Monitoring Program. Beginning in winter 2016, the LOWRF monitoring schedule was shifted from spring and fall monitoring to summer and winter monitoring. As a result, data from the LOWRF monitoring program no longer coincides with the monitoring schedule adopted in the LOBP. A total of 22 LOBP network wells, including all five nitrate metric wells, were switched to the summer and winter monitoring schedule.

CHG plans to continue measuring water levels in April and October 2019 at selected LOBP network wells that overlap with the LOWRF program. Water quality testing, however, will not be duplicated in the schedule, and data from LOWRF monitoring in June and December 2019 will be used for reporting purposes.

A nested monitoring well cluster is planned for completion in the Cuesta-by-the-Sea area during 2019. The new well cluster should be ready for sampling during the October 2019 monitoring event.



Scope of Work

CHG will perform the following tasks for the LOBP groundwater monitoring program, per the attached tables.

- Conduct/coordinate semi-annual water level monitoring in April and October 2019 at up to 43 locations.
- Download and process pressure transducer data at up to 8 wells.
- Conduct/coordinate groundwater sampling in April 2019 from up to 11 wells for general mineral analyses.
- Conduct/coordinate groundwater sampling in October 2019 from up to 21 wells for general mineral analyses, including the new monitoring well cluster planned for completion in 2019.
- Conduct groundwater sampling in October 2019 from up to two wells for CEC's analyses, include two equipment blanks and one travel blank.

Deliverables

Tables with results of water level and water quality monitoring will be provided upon completion of the April and October 2019 monitoring events. Data interpretation and reporting is not included in this scope of work, but will be performed during 2019 Annual Report preparations.

Schedule

The scope of work would be completed per the Basin Plan monitoring schedule (April and October monitoring).

Fees and Conditions

CHG proposed to perform the above scope of work on an hourly rate plus expenses basis in accordance with the attached terms of fees and conditions and the hourly rate schedule listed below. Laboratory analytical services, pump equipment, and CEC sample shipping are estimated at \$10,000. The cost for hydrogeologic services related to water level monitoring, groundwater sampling, transducer downloading, and coordination with private well owners is estimated to be \$19,200. The total cost for the 2019 groundwater monitoring scope of work is estimated at **\$29,200**.



SCHEDULE OF HOURLY RATES

Principal Hydrogeologist	\$ 160
Senior Hydrogeologist	\$ 150
Project Geologist	\$ 135
Environmental Scientist	\$ 120
GIS Specialist	\$ 120
Staff Geologist Level II	\$ 120
Staff Geologist Level I	\$ 100

EXPENSES

Mileage \$0.54/mile
Other expenses at cost plus 10 percent handling.

If the herein described work scope, fees and conditions are acceptable, this proposal will serve as the basis for agreement.

Cleath-Harris Geologists, Inc.

Spencer J. Harris, Vice President



SCHEDULE OF FEES AND CONDITIONS

- Invoices will be submitted monthly. The invoice is due and payable upon receipt.
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- All of the terms, conditions and provisions hereof shall inure to the benefit of and be binding upon the parties hereto and their respective successors and assigns, provided, however, that no assignment of the contract shall be made without written consent of the parties to the agreement.