M E E T I N G N O T I C E AND A G E N D A

TECHNICAL ADVISORY COMMITTEE
OF THE
SEASIDE BASIN WATER MASTER

DATE: Wednesday, November 21, 2018
MEETING TIME: 1:30 p.m.
Monterey Regional Water Pollution Control Agency Offices
5 Harris Court, Building D (Ryan Ranch)
Monterey, CA 93940

If you wish to participate in the meeting from a remote location, please call in on the Watermaster Conference Line by dialing (712) 432-1212. Use the Meeting ID 355890617. Please note that if no telephone attendees have joined the meeting by 10 minutes after its start, the conference call will be ended.

OFFICERS
Chairperson: Nina Miller, California American Water Company
Vice-Chairperson: Jon Lear, MPWMD

MEMBERS

California American Water Company | **City of Del Rey Oaks** | **City of Monterey**
City of Sand City | **City of Seaside** | **Coastal Subarea Landowners**
Laguna Seca Property Owners | **Monterey County Water Resources Agency**
Monterey Peninsula Water Management District

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SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	2.A
AGENDA TITLE:	Approve Minutes from the August 15, 2018 Meeting
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Draft Minutes from this meeting was emailed to all TAC members. Any changes requested by TAC members have been included in the attached version.

ATTACHMENTS:	Minutes from this meeting
RECOMMENDED ACTION:	Approve the minutes

D-R-A-F-T
MINUTES

Seaside Groundwater Basin Watermaster
Technical Advisory Committee Meeting
August 15, 2018

Attendees: TAC Members

City of Seaside –Rick Riedl
California American Water – Robert James
City of Monterey – Laurie Williamson (via telephone)
Laguna Seca Property Owners – No Representative
MPWMD – Jon Lear
MCWRA – Tamara Voss
City of Del Rey Oaks – No Representative
City of Sand City – Leon Gomez (via telephone)
Coastal Subarea Landowners – No Representative

Watermaster
Technical Program Manager - Robert Jaques

Consultants
None

Others
None

The meeting was convened at 1:35 p.m. after a quorum had been established.

1. Public Comments
There were no public comments.

2. Administrative Matters:

A. Approve Minutes from the July 11, 2018 Meeting
On a motion by Ms. Voss, seconded by Mr. Lear, the minutes from this meeting were unanimously approved as presented.

B. Sustainable Groundwater Management Act (SGMA) Items
Mr. Jaques summarized the agenda packet materials for this item.

With regard to the Salinas Valley Basin Groundwater Sustainability Agency Advisory Committee item, Mr. Lear recommended having Mr. Jaques contact the Department of Water Resources to get their input on the best way for the Watermaster to coordinate with the Salinas Valley Basin Groundwater Sustainability Agency with regard to their development of a Groundwater Sustainability Plan for the Corral di Tierra subarea of their basin. He noted that the Seaside Basin is an adjudicated basin and therefore won't be required to develop its own Groundwater Sustainability Plan. Mr. Jaques said he would make that contact and report back to the TAC on his findings.

With regard to the Remote Sensing Workshop item, Mr. Lear reported that the Santa Cruz mid-County water group had received a presentation by a New Zealand firm that also does remote sensing. Mr. Lear offered to give a presentation on this at a future TAC meeting.

3. Approve the FY 2019 Monitoring and Management Program (M&MP) and 2019 and 2020 M&MP Operations and Capital Budgets

Mr. Jaques summarized the agenda packet materials for this item.

Ms. Voss asked if the barium and iodide water quality tests were providing information that was of any benefit. Mr. Jaques said that those tests had been recommended by HydroMetrics and approved by the TAC several years ago. Mr. Lear elaborated that the data is reviewed in conjunction with preparation of the annual water quality report that is prepared by the Monterey Peninsula Water Management District.

There was a brief discussion with regard to whether it would be beneficial to include in the M&MP Operations Budget a line-item for undertaking remote sensing to attempt to identify the offshore location of the seawater intrusion front. Following that discussion there was consensus that at this point in time there was not sufficient information to determine whether that would be a worthwhile undertaking for the Watermaster. However, the topic will be considered further and if it is felt desirable to undertake such work, it could probably be funded from the Contingency line-item within the M&MP budget, if approved by the Board.

On a motion by Mr. Lear, seconded by Mr. Riedl, the FY 2019 Monitoring and Management Program, and its Operations and Capital Budgets, were unanimously approved as presented.

4. Schedule

Mr. Jaques summarized the agenda packet materials for this item, and highlighted that there would be no TAC meetings in September or October.

With regard to the November meeting date there was some discussion as to whether it would be better to hold the meeting on the second or third Wednesday, recognizing that Thanksgiving would be the day after the third Wednesday in November. At the conclusion of that discussion Mr. Jaques offered to alert the TAC in early November whether it would be possible to receive from the consultants all of the information needed to make a complete presentation to the TAC on the Draft Annual Report for 2018 by the second Wednesday rather than the currently-planned third Wednesday meeting date. If the information could be available in time for the second Wednesday meeting date, then the meeting would be held on the second Wednesday. If more time was needed, the meeting would be held on the third Wednesday. This was satisfactory to the TAC.

5. Other Business

Mr. Lear provided this oral update on the geochemical modeling study:
Over the week of July 23rd, as a component of the well drilling efforts related to Pure Water Monterey, MPWMD staff collected a sonic core of the top 17 feet of the Santa Margarita Formation. At that time the column pipe being used to advance the core sheared off in the hole preventing collection of more samples. The plan was to collect a continuous core over the entire length of the Santa Margarita, but that will not be possible. However the samples that were collected will be useful for analysis that will be used to populate the geochemical database and be useful in the Geochemical Study we are undertaking. A deep injection well is to be drilled the

week of August 27 and MPWMD staff will collect cuttings from the entire length of the Santa Margarita. We will compare similar analyses between the cuttings and the sonic core and if they are comparable, cuttings from the highest producing zones of the Santa Margarita will also be bench tested to help populate the geochemical database.

The meeting adjourned at 2:03 p.m.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

**** * * AGENDA TRANSMITTAL FORM * * ****

MEETING DATE:	November 21, 2018
AGENDA ITEM:	2.B
AGENDA TITLE:	Well Completion Logs for the Pure Water Monterey Groundwater Replenishment Project
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Maureen Hamilton, Project Manager for the Pure Water Monterey Injection Wells, provided the six attached well completion reports (WCRs) from their monitoring wells drilled in Phase 2.

She reports that they have completed construction of all eight monitoring wells that are planned to be constructed in PWM Phases 1 and 2. The first two WCRs for the two monitoring wells constructed during Phase 1 were sent to us in October 2017.

Two deep injection wells are planned to be constructed in PWM Phases 1 and 2. The WCR for the first deep injection well constructed during Phase 1 was sent to us in January 2018.They will submit the WCR for the second deep injection well when the well is completed.

The WCRs are required to be sent to the Water Board by Order No. R3-2017-0003.

This is provided to the TAC for information.

ATTACHMENTS:	Well completion reports
RECOMMENDED ACTION:	None required – Information Only

State of California

Well Completion Report

Form DWR 188 In Review 9/10/2018

WCR2018-007867

Owner's Well Number: MW-1AS | Date Work Began: 08/03/2018 | Date Work Ended: 08/14/2018

Local Permit Agency: Environmental Health Services of Monterey County

Secondary Permit Agency: | Permit Number: 18-13012 | Permit Date: 06/04/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: MONTEREY ONE WATER

Mailing Address: 5 Harris Ct., Bldg. D

City: Monterey | State: CA | Zip: 93940

Planned Use and Activity

Activity: New Well

Planned Use: Monitoring

Well Location

Address: Former Fort Ord – SE of Gen. Jim Moore Blvd and Eucalyptus Rd

City: Seaside | Zip: 93955 | County: Monterey

	Deg.	Min.	Sec.		
Latitude	36	37	10.9956	N	
Longitude	-121	48	53.8560	W	

Dec. Lat.: 36.619721 | Dec. Long.: -121.814960

Vertical Datum: NAVD88 | Horizontal Datum: NAD83

Location Accuracy: Unknown | Location Determination Method: Unknown

APN: 031-151-062-000

Township: 15S

Range: 01E

Section: 24

Baseline Meridian: Mount Diablo

Ground Surface Elevation: 395

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Direct Rotary | Drilling Fluid: Bentonite

Total Depth of Boring: 480 Feet

Total Depth of Completed Well: 470 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: 365.3 (Feet) | Date Measured: 09/20/2018

Estimated Yield*: (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	295	Fine to Medium Sand
295	305	Silty Sand
305	310	Fine to Medium Sand
310	315	Medium to Coarse Sand
315	320	Fine to Medium Sand
320	335	Medium to Coarse Sand
335	345	Fine to Medium Sand
345	365	Silty Sand
365	375	Clayey Silty Sand
375	400	Fine to Medium Sand
400	420	Silty Sand
420	430	Silt and Fine to Coarse Sand
430	460	Clayey Silty Sand
460	480	Silty Sand

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	380	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread
1	380	460	Screen	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5	Saw Cut	0.02	Johnson Flush Thread
1	460	470	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	140	Cement	Portland Cement/Neat Cement		
140	360	Bentonite	Other Bentonite		Cetco Bentonite Grout
360	390	Bentonite	High Solids		Cetco 3/8 pellets
390	480	Filter Pack	Other Gravel Pack	12x20	SRI No. 12

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	480	12.25

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: MAGGIORA BROS DRILLING INC (Person, Firm or Corporation)

595 AIRPORT BLVD (Address) | WATSONVILLE (City) | CA (State) | 95076 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 09/10/2018 (Date Signed) | 249957 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

				N						W

Latitude Deg/Min/Sec | Longitude Deg/Min/Sec

TRS:

APN:

State of California

Well Completion Report

Form DWR 188 Submitted 9/10/2018

WCR2018-007869

Owner's Well Number: MW-2AS | Date Work Began: 08/16/2018 | Date Work Ended: 08/28/2018

Local Permit Agency: Environmental Health Services of Monterey County

Secondary Permit Agency: | Permit Number: 18-13035 | Permit Date: 05/31/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: MONTEREY ONE WATER

Mailing Address: 5 Harris Ct., Bldg. D

City: Monterey | State: CA | Zip: 93940

Planned Use and Activity

Activity: New Well

Planned Use: Monitoring

Well Location

Address: Former Fort Ord – SE of Gen. Jim Moore Blvd and Eucalyptus Rd

City: Seaside | Zip: 93955 | County: Monterey

Latitude: 36 Deg. 37 Min. 5.6208 Sec. N | Longitude: -121 Deg. 49 Min. 0.4152 Sec. W

Dec. Lat.: 36.618228 | Dec. Long.: -121.816782

Vertical Datum: NAVD88 | Horizontal Datum: NAD83

Location Accuracy: Unknown | Location Determination Method: Unknown

APN: 031-211-001-000

Township: 15S

Range: 01E

Section: 23

Baseline Meridian: Mount Diablo

Ground Surface Elevation: 365

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Direct Rotary | Drilling Fluid: Bentonite

Total Depth of Boring: 440 Feet

Total Depth of Completed Well: 430 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: 379.0 (Feet) | Date Measured: 09/20/2018

Estimated Yield*: (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	1	Silty Sand
1	7	Silty Sand
7	37	V. Fine to Fine Sand
37	38	Fine Sand
38	43	V. Fine to Fine Sand
43	44	Clayey Sand
44	47	V. Fine to Fine Sand
47	59	Sand with Clay
59	68	V. Fine to Fine Sand
68	77	V. Fine to Medium Sand
77	119	V. Fine to Fine Sand
119	120	V. Fine to Fine Sand with Clay Nodules
120	138	V. Fine to Fine Sand some Clay Nodules
138	148	V. Fine to Medium Sand some Clay Nodules
148	156	Silty Sand

156	160	V. Fine to Medium Sand some Clay Nodules
160	167	Clayey Fine Sand
167	179	No Sample
179	181	Fine sand
181	200	V. Fine to Fine Sand
200	201	Fine to Medium Sand
201	230	V. Fine to Fine Sand
230	233	V. Fine to Medium Sand with Clay
233	240.5	V. Fine to Fine Sand
240.5	242.5	Fine Sand with Clay
242.5	247	Silty Sandy Clay
247	251	Silty Sand
251	261	V. Fine to Medium Sand with Clay
261	263	Silty Sand
263	265	Fine to Medium Sand
265	267	Clayey Silty Sand
267	268.5	Fine to Coarse Sand
268.5	273	Silty Sand
273	277	Fine to Coarse Sand
277	285	Silty Sand
285	303	Silty Sand with Clay Nodules
303	305	Silty Sand some Gravel
305	308	Silty Clayey Sand Trace Gravel
308	313	Silty Sand some Gravel
313	314	Silt with Sand
314	316	Clay with Silt Lenses
316	317	Fine Sand
317	320	Sandy Clay
320	322	Clayey Silty Sand
322	323	Clayey Sand
323	325	Sand with Clay
325	327	Silty Fine Sand
327	328	Fine to Coarse Sand Some Gravel
328	334	Sandy Clay
334	338	Silty Sand with Clay Nodules
338	346	Clayey Sand
346	350	Silty Fine Sand
350	357	Silty sand
357	358	V. Fine to Fine Sand
358	360	Sandy Silt
360	363	Silty Sand
363	364	Sand with Silt and Clay Nodules
364	365	Clayey Sandy Silt
365	367	Clayey Sand trace Gravel
367	370	Sandy Clay
370	377	Clayey Sand
377	379	Silty Clay with Sand
379	381	Clayey Sand
381	387	Silty Sand

387	388	Silty Sand Trace Fine to Coarse Gravel
388	392	Clayey Sand some Gravel
392	395	Silty Sand with Gravel
395	397	Silty Sand with Clay Nodules
397	403	Sandy Clay with Gravel
403	405	Clay with Sand
405	415	No Sample Observed
415	420	Fine Sand
420	425	No Sample
425	440	Sand with Clay

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	340	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread
1	340	420	Screen	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5	Saw Cut	0.02	Johnson Flush Thread
1	420	430	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	140	Cement	Portland Cement/Neat Cement		
140	320	Bentonite	Other Bentonite		Cetco Bentonite Grout
320	330	Bentonite	High Solids		Cetco 3/8 pellets
330	440	Filter Pack	Other Gravel Pack	12x20	SRI No. 12

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	440	12.25

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: MAGGIORA BROS DRILLING INC
Person, Firm or Corporation

595 AIRPORT BLVD (Address) | WATSONVILLE (City) | CA (State) | 95076 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 09/10/2018 (Date Signed) | 249957 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

State of California

Well Completion Report

Form DWR 188 In Review 9/10/2018

WCR2018-007866

Owner's Well Number: MW-1AD | Date Work Began: 07/13/2018 | Date Work Ended: 08/02/2018

Local Permit Agency: Environmental Health Services of Monterey County

Secondary Permit Agency: | Permit Number: 18-13008 | Permit Date: 06/04/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: MONTEREY ONE WATER

Mailing Address: 5 Harris Ct., Bldg. D

City: Monterey | State: CA | Zip: 93940

Planned Use and Activity

Activity: New Well

Planned Use: Monitoring

Well Location

Address: Former Fort Ord – SE of Gen. Jim Moore Blvd and Eucalyptus Rd

City: Seaside | Zip: 93955 | County: Monterey

Latitude: 36 Deg. 37 Min. 11.1360 Sec. N | Longitude: -121 Deg. 48 Min. 53.8056 Sec. W

Dec. Lat.: 36.61976 | Dec. Long.: -121.814946

Vertical Datum: NAVD88 | Horizontal Datum: NAD83

Location Accuracy: Unknown | Location Determination Method: Unknown

APN: 031-151-062-000

Township: 15S

Range: 01E

Section: 24

Baseline Meridian: Mount Diablo

Ground Surface Elevation: 395

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Direct Rotary | Drilling Fluid: Water

Total Depth of Boring: 900 Feet

Total Depth of Completed Well: 880 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: 419.1 (Feet) | Date Measured: 09/20/2018

Estimated Yield*: (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	295	Fine to Medium Sand
295	305	Silty Sand
305	310	Fine to Medium Sand
310	315	Medium to Coarse Sand
315	320	Fine to Medium Sand
320	335	Medium to Coarse Sand
335	345	Fine to Medium Sand
345	365	Silty Sand
365	375	Clayey Silty Sand
375	400	Fine to Medium Sand
400	420	Silty Sand
420	430	Silty and Fine to Coarse Sand
430	460	Clayey Silty Sand
460	480	Silty Sand
480	505	Fine, Medium, and Coarse Sand

505	530	Fine Sand
530	570	Clayey Silty Sand
570	575	Fine Sand
575	595	Silty Sand
595	620	Silty Fine to Medium Sand
620	630	Fine, Medium, and Coarse Sand
630	830	Medium Sand
830	850	Medium to Coarse Sand
850	880	Fine to Medium Sand
880	890	Fine Sand with shell fragments
890	900	Sandy Clay (Monterey Shale)

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	610	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread
1	610	870	Screen	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5	Saw Cut	0.02	Johnson Flush Thread
1	870	880	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	140	Cement	Portland Cement/Neat Cement		
140	590	Bentonite	Other Bentonite		Cetco Bentonite Grout
590	600	Bentonite	High Solids		Cetco 3/8 pellets
600	900	Filter Pack	Other Gravel Pack	12x20	SRI No. 12

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	900	12.25

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: MAGGIORA BROS DRILLING INC (Person, Firm or Corporation)

595 AIRPORT BLVD (Address) | WATSONVILLE (City) | CA (State) | 95076 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 09/10/2018 (Date Signed) | 249957 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

State of California

Well Completion Report

Form DWR 188 In Review 9/10/2018

WCR2018-007861

Owner's Well Number: MW-2S | Date Work Began: 07/06/2018 | Date Work Ended: 07/17/2018

Local Permit Agency: Environmental Health Services of Monterey County

Secondary Permit Agency: | Permit Number: 18-12993 | Permit Date: 05/31/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: MONTEREY ONE WATER

Mailing Address: 5 Harris Ct., Bldg. D

City: Monterey | State: CA | Zip: 93940

Planned Use and Activity

Activity: New Well

Planned Use: Monitoring

Well Location

Address: Former Fort Ord – SE of Gen. Jim Moore Blvd and Eucalyptus Rd

City: Seaside | Zip: 93955 | County: Monterey

Latitude: 36 Deg. 37 Min. 0.4656 Sec. N | Longitude: -121 Deg. 49 Min. 1.2972 Sec. W

Dec. Lat.: 36.616796 | Dec. Long.: -121.817027

Vertical Datum: NAVD88 | Horizontal Datum: NAD83

Location Accuracy: Unknown | Location Determination Method: Unknown

APN: 031-211-001-000

Township: 15S

Range: 01E

Section: 23

Baseline Meridian: Mount Diablo

Ground Surface Elevation: 363

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Direct Rotary | Drilling Fluid: Bentonite

Total Depth of Boring: 420 Feet

Total Depth of Completed Well: 410 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: 384.3 (Feet) | Date Measured: 09/20/2018

Estimated Yield*: (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	420	Sand
0	320	medium sand
320	330	fine sand, silt, and clay
330	340	medium sand
340	345	silty sand
345	350	medium sand
350	355	silty sand
355	360	fine to medium sand
360	370	silty sand
370	420	fine to medium sand

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	340	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread
1	340	400	Screen	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5	Saw Cut	0.02	Johnson Flush Thread
1	400	410	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	140	Cement	Portland Cement/Neat Cement		
140	320	Bentonite	Other Bentonite		Cetco Bentonite Grout
320	330	Bentonite	High Solids		Cetco 3/8 pellets
330	420	Filter Pack	Other Gravel Pack	12x20	SRI No. 12

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	420	12.25

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: MAGGIORA BROS DRILLING INC
Person, Firm or Corporation

595 AIRPORT BLVD (Address) | WATSONVILLE (City) | CA (State) | 95076 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 09/09/2018 (Date Signed) | 249957 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

State of California

Well Completion Report

Form DWR 188 In Review 9/10/2018

WCR2018-007862

Owner's Well Number: MW-2D | Date Work Began: 06/12/2018 | Date Work Ended: 06/25/2018

Local Permit Agency: Environmental Health Services of Monterey County

Secondary Permit Agency: | Permit Number: 18-12992 | Permit Date: 05/31/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: MONTEREY ONE WATER

Mailing Address: 5 Harris Ct., Bldg. D

City: Monterey | State: CA | Zip: 93940

Planned Use and Activity

Activity: New Well

Planned Use: Monitoring

Well Location

Address: Former Fort Ord – SE of Gen. Jim Moore Blvd and Eucalyptus Rd

City: Seaside | Zip: 93955 | County: Monterey

Latitude: 36 Deg. 37 Min. 0.5664 Sec. N | Longitude: -121 Deg. 49 Min. 1.4376 Sec. W

Dec. Lat.: 36.616824 | Dec. Long.: -121.817066

Vertical Datum: NAVD88 | Horizontal Datum: NAD83

Location Accuracy: Unknown | Location Determination Method: Unknown

APN: 031-211-001-000

Township: 15S

Range: 01E

Section: 23

Baseline Meridian: Mount Diablo

Ground Surface Elevation: 362

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Direct Rotary | Drilling Fluid: Bentonite

Total Depth of Boring: 660 Feet

Total Depth of Completed Well: 620 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: 385.6 (Feet) | Date Measured: 09/20/2018

Estimated Yield*: (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	320	medium sand
320	330	fine sand, silt, and clay
330	340	medium sand
340	345	silty sand
345	350	medium sand
350	355	silty sand
355	360	fine to medium sand
360	370	silty sand
370	460	fine to medium sand
460	495	medium to coarse sand
495	500	silty sand
500	520	coarse sand
520	550	medium to coarse sand
550	605	coarse sand
605	610	gravel and coarse sand

610	615	medium and coarse sand
615	630	gravel and coarse sand
630	660	dark gray soft, sticky silty, sandy, clay

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	480	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread
1	480	610	Screen	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5	Saw Cut	0.02	Johnson Flush Thread
1	610	620	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Tread

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	140	Cement	Portland Cement/Neat Cement		
140	460	Bentonite	Other Bentonite		Cetco Bentonite Grout
460	470	Bentonite	High Solids		Cetco 3/8 pellets
470	630	Filter Pack	Other Gravel Pack	12x20	SRI No. 12
630	660	Other Fill	See description.		Drill Cuttings

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	630	12.25
630	660	8.75

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: MAGGIORA BROS DRILLING INC
Person, Firm or Corporation

595 AIRPORT BLVD (Address) | WATSONVILLE (City) | CA (State) | 95076 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 09/09/2018 (Date Signed) | 249957 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

N — Latitude Deg/Min/Sec

W — Longitude Deg/Min/Sec

TRS:

APN:

State of California

Well Completion Report

Form DWR 188 In Review 9/10/2018

WCR2018-007863

Owner's Well Number: MW-2AD | Date Work Began: 06/20/2018 | Date Work Ended: 07/05/2018

Local Permit Agency: Environmental Health Services of Monterey County

Secondary Permit Agency: | Permit Number: 18-13007 | Permit Date: 06/04/2018

Well Owner (must remain confidential pursuant to Water Code 13752)

Name: MONTEREY ONE WATER

Mailing Address: 5 Harris Ct., Bldg. D

City: Monterey | State: CA | Zip: 93940

Planned Use and Activity

Activity: New Well

Planned Use: Monitoring

Well Location

Address: Former Fort Ord – SE of Gen. Jim Moore Blvd and Eucalyptus Rd

City: Seaside | Zip: 93955 | County: Monterey

Latitude: 36 Deg. 37 Min. 5.6892 Sec. N | Longitude: -121 Deg. 49 Min. 0.5772 Sec. W

Dec. Lat.: 36.618247 | Dec. Long.: -121.816827

Vertical Datum: NAVD88 | Horizontal Datum: NAD83

Location Accuracy: Unknown | Location Determination Method: Unknown

APN: 031-211-001-000

Township: 15S

Range: 01E

Section: 23

Baseline Meridian: Mount Diablo

Ground Surface Elevation: 365

Elevation Accuracy:

Elevation Determination Method:

Borehole Information

Orientation: Vertical | Specify:

Drilling Method: Direct Rotary | Drilling Fluid: Bentonite

Total Depth of Boring: 730 Feet

Total Depth of Completed Well: 700 Feet

Water Level and Yield of Completed Well

Depth to first water: (Feet below surface)

Depth to Static Water Level: 389.6 (Feet) | Date Measured: 09/20/2018

Estimated Yield*: (GPM) | Test Type:

Test Length: (Hours) | Total Drawdown: (feet)

*May not be representative of a well's long term yield.

Geologic Log - Free Form

Depth from Surface Feet to Feet		Description
0	15	No Samples
15	20	Fine Sand
20	25	Fine to medium sand
25	55	fine sand
55	60	Fine to medium sand
60	75	fine sand
75	80	medium sand
80	90	Fine to medium sand
90	205	Fine sand
205	235	very fine sand
235	280	Fine Sand
280	285	Medium to coarse sand
285	305	Fine to medium sand
305	315	Med. To coarse sand
315	320	Fine to medium sand

330	335	medium sand
335	340	fine to medium sand
340	360	very fine sand / Silt
360	365	Fine Sand
365	375	Very fine and / silt
375	405	Clayey Sand, fine sand/silt
405	430	Clayey Sand, fine sand/silt gravel
430	490	Clay / silt / / sand / gravel
490	495	silty clayey sand
500	505	silty sand
515	520	fine to coarse sand
540	545	silty fine sand
555	560	silty clayey sand
575	580	Medium to coarse sand
580	680	Fine sand
680	710	Fine sand and angular shell fragments
710	730	Sandy Clay Monterey Fmn.

Casings

Casing #	Depth from Surface Feet to Feet		Casing Type	Material	Casings Specificatons	Wall Thickness (inches)	Outside Diameter (inches)	Screen Type	Slot Size if any (inches)	Description
1	0	480	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread
1	480	690	Screen	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5	Saw Cut	0.02	Johnson Flush Thread
1	690	700	Blank	PVC	OD: 4.500 in. | Thickness: 0.337 in.	0.337	4.5			Johnson Flush Thread

Annular Material

Depth from Surface Feet to Feet		Fill	Fill Type Details	Filter Pack Size	Description
0	140	Cement	Portland Cement/Neat Cement		
140	460	Bentonite	Other Bentonite		Cetco Bentonite Grout
460	470	Bentonite	High Solids		Cetco 3/8 pellets
470	730	Filter Pack	Other Gravel Pack	12x20	SRI No. 12

Other Observations:

Borehole Specifications

Depth from Surface Feet to Feet		Borehole Diameter (inches)
0	730	12.25

Certification Statement

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name: MAGGIORA BROS DRILLING INC (Person, Firm or Corporation)

595 AIRPORT BLVD (Address) | WATSONVILLE (City) | CA (State) | 95076 (Zip)

Signed: *electronic signature received* (C-57 Licensed Water Well Contractor) | 09/09/2018 (Date Signed) | 249957 (C-57 License Number)

DWR Use Only

CSG #	State Well Number	Site Code	Local Well Number

				N						W

Latitude Deg/Min/Sec | Longitude Deg/Min/Sec

TRS:

APN:

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	2.C
AGENDA TITLE:	Sustainable Groundwater Management Act (SGMA) Update
PREPARED BY:	Robert Jaques, Technical Program Manager

At the State level:
Since my last update, I have not received any new materials from the State that would impact the Watermaster. However, in response to a request from Jon Lear at the August 15, 2018 TAC meeting I contacted DWR regarding our planned means of interfacing with the Salinas Valley Basin Groundwater Sustainability Agency (SVBGSA). My email to DWR, and their response, are attached. They concur with the approach we are taking and offered several suggestions regarding things we could do in our interfacing with the SVBGSA. The email exchanges on this are attached

At the Monterey County level:
The SVBGSA held a series of public workshops with their consultant who is preparing a rate structure to fund the costs of the SVBGSA. As this did not appear to have any direct impact on the Watermaster, I did not attend any of the workshops. Attached is a summary of the feedback received by the SVBGSA from the workshops.

Also, Derrik Williams of Montgomery & Associates (formerly HydroMetrics) has established the attached schedule of dates associated with review of the Groundwater Sustainability Plan for the Salinas Valley Basin.

Derrik also commented in a recent email to me that *"The Watermaster's modeling, and how it interacts with the SVBGSA work is a very important issue that we need to broach. As you are aware, we are submitting separate GSPs for each subbasin. The Monterey Subbasin is the subbasin that has a direct influence on the Seaside Basin. We are developing that GSP in coordination with Marina Coast Water District and their consultant, EKI. That GSP hasn't gone far yet; but once it takes off we will definitely be talking about how the GSP influences the Seaside Basin."*

If the SVBGSA forms a TAC to provide input to the development of its GSPs, as it previously indicated it would, Gary Peterson has concurred with my request to be on that TAC. This will ensure that our concerns are addressed regarding the impacts on the Laguna Seca Subarea of pumping within the Monterey Subbasin.

At the SVBGSA Advisory Committee meeting on November 15the principle agenda item was a presentation by Derrik Williams on draft chapters of the GSP for the 180-400 foot aquifer and the draft Valley Wide Management Plan. At this point in time only the initial draft chapters of these reports had been prepared and none of them contained any content that would directly impact the Watermaster or the Seaside Basin. I did, however, request that some language be added explaining that for the Seaside Subbasin of the Salinas Valley Basin, the Watermaster had been created by the Court under the

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

AGENDA ITEM:	2.C (Continued)
Adjudication Decision, and what the role of the Watermaster is.	
ATTACHMENTS:	1. Emails to/from DWR regarding interfacing with the SVBGSA. 2. Summary of feedback from SVBGSA fee study workshops 3. Dates associated with GSP review (for the Salinas Valley Basin)
RECOMMENDED ACTION :	None required – information only

ATTACHMENT 1

From: bobj83@comcast.net <bobj83@comcast.net>
Sent: Monday, August 20, 2018 7:51 PM
To: 'Timothy.Ross@water.ca.gov' <Timothy.Ross@water.ca.gov>
Cc: Bob Jaques (bobj83@comcast.net) <bobj83@comcast.net>
Subject: Coordination with Salinas Valley Basin GSA on their development of a GSP

Tim,

As an adjudicated basin we will not be preparing a GSP, although we do already have a Basin Management Plan which we use in managing the groundwater in the Seaside Basin. However, we very much wish to have input to the Salinas Valley Basin GSA on the preparation of their GSP, particularly in what was previously referred to as the Corral di Tierra subarea of the SVB, since pumping in that area affects ground water levels in the Laguna Seca subarea of the Seaside Basin.

I have been planning to do this through my participation as a member of the SVBGSA's Advisory Committee, and their soon-to-be-formed GSP TAC. Through participation in the meetings of those groups, I have been planning to present the findings of our groundwater modeling that demonstrates the hydrogeologic connectivity between the LSSA and the Corral di Tierra areas, and thereby request and ensure that their GSP takes this into account as they develop their Minimum Thresholds and Minimum Objectives for that portion of the SVB.

I was asked to check in with you to see if you concur that this would be the appropriate means of coordinating between the Seaside Basin and the Salinas Valley Basin on these issues, or if you have another approach to suggest.

Your input and guidance will be appreciated.

Thanks,

Robert S. Jaques, PE
Technical Program Manager
Seaside Basin Watermaster
83 Via Encanto
Monterey, CA 93940
Office: (831) 375-0517
Cell: (831) 402-7673

Hi Bob – Thank you for the email.

Yes – it seems to me that you are in a good position to help make sure that the GSP takes into consideration the effects on your adjudication. In addition, the GSP needs to make sure that they do not put in jeopardy the sustainability of an adjacent subbasin. With you being able to supply modeling that shows connectivity and hopefully the amount and direction of flow across the boundary, they can factor that into their budget. Things to consider may be monitoring at the boundary that helps define the change across the boundary and setting thresholds and objectives based on the monitoring for that boundary. This would provide good rationale for the setting or the minimum thresholds there. It is a concrete reason to set those goals and triggers. You might also think about how the Watermaster may be able to assist the GSA if the minimum threshold is reached to bring make sure the GSA does not have significant impact on the adjudicated area.
Cheers,
Tim

Timothy M. Ross Ph.D., PG, CHG
Department of Water Resources
Southern Region
770 Fairmont Ave. Suite 102
Glendale CA 91203
(818) 549-2345
Timothy.ross@water.ca.gov

ATTACHMENT 2

GSA FEE STUDY

The SVBGSA hosted four workshops in the Salinas Valley to explain the agency's obligation to adopt a fee to provide funding for the operations of the agency and development of Groundwater Management Plans.

The meetings were held in Soledad, Castroville, Salinas and King City and information was provided about the Sustainable Groundwater Management Act (SGMA) and Salinas Valley Basin GSA's mission and role in developing groundwater management plans. The fee study presentation included background, various fee options under consideration, feedback received from interested parties/stakeholder groups, and direction provided by the SVBGSA board of directors and advisory committee. The workshop presentation can be viewed at https://svbgsa.org/fee-study/public-involvement/.

Common discussion items included:

- The fee is for administration of the GSA, not for any current or future project, and for most, will be very minimal.
- The fee recognizes and charges all beneficiaries (such as municipal, agricultural, commercial, industrial, government and environmental) of groundwater sustainability.
- All Salinas Valley Basin property owners within the boundaries of the SVBGSA, whether in the north or south area, will be charged using the same methodology; fees will be uniform by user groups.
- Users who contribute back to the groundwater supply through groundwater recharge, recycled water, return to local creeks and streams and so forth will be charged the same fee. While valid considerations, given the timing and anticipated fee amounts, these will be taken up in the future, or may be addressed at project stage rather than as part of the administration fee.
- Property owners who pay a municipality for water service will be billed with property taxes unless the SVBGSA Board adopts an option that allows water service providers to pay their entire fee directly to the GSA, in which case the water service provider will bill customers directly on the utility bill.
- The fee level will be reviewed annually. Changes to the methodology for calculating the fee may also be made as data availability and reliability evolves.
- A sunset or cap to the fee is not feasible unless an alternative funding source is identified and secured.
-

The fee will ultimately need to be adopted by a super majority of the SVBGSA Board of Directors under the authority of SGMA as a regulatory fee.

A Fee Study presentation was given to the SVBGSA Board on October 11, 2018, which incorporated input received from the SVBGSA Board, Advisory Committee and public workshop attendees. The presentation may be viewed at https://bit.ly/2OO7gAB.

ATTACHMENT 3

DATES ASSOCIATED WITH GSP REVIEW

GSP Chapter	Title	Draft completed	Planning Committee	Advisory Committee Presentation	Board Meeting Presentation
1	Introduction	31-Oct-18	6-Nov-18	15-Nov-18	13-Dec -18
2	Agency Information	31-Oct-18	6-Nov-18	15-Nov-18	13-Dec -18
3	Description of Area	31-Oct-18	6-Nov-18	15-Nov-18	13-Dec -18
4	Hydrogeologic Conceptual Model	30-Nov-18	6-Dec-18	20-Dec-18	10-Jan-19
5	Groundwater Conditions	30-Nov-18	6-Dec-18	20-Dec-18	10-Jan-19
6	Water Budget (historic)	13-Feb-19	7-Feb-19	21-Feb-19	14-Mar-19
	Water Budget (current)	14-Mar-19	TBD	21-Mar-19	11-Apr-19
7	Sustainable Management Criteria	13-Feb-19	7-Feb-19	21-Feb-19	14-Mar-19
8	Monitoring Networks	13-Feb-19	7-Feb-19	21-Feb-19	14-Mar-19

SEASIDE BASIN WATER MASTER TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	2.D
AGENDA TITLE:	Update on Potential Expansion of the Pure Water Monterey (PWM) Project
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY: I attended a workshop on August 14 at which representatives of Monterey One Water (M1W) provided updating information about the PWM project. Here were some of the points made in their presentation:

- In May 2018 M1W submitted a feasibility report to the CPUC regarding expanding the capacity of the PWM project.
- At its August meeting the CPUC requested M1W to evaluate the potential to expand the PWM project from its current 3,500 AFY size to a larger size.
- M1W is currently exploring the potential to add 2,250 AFY of capacity to the PWM project.
- During the winter months, between 6,000 and 8,000 AFY of secondary effluent produced by M1W's Regional Wastewater Treatment Plant is currently being discharged through their outfall to Monterey Bay. This is effluent in excess of the amount of recycled water the M1W Recycling Plant produces for delivery to growers in the lower Salinas Valley under the Salinas Valley Reclamation Project.
- Under existing agreements between M1W and other entities, during summer months there is also approximately 650 AFY of recycled water capacity available.
- In order to expand the capacity of the PWM project permit modifications and regulatory agency approvals will be needed.
- M1W is currently researching funding sources for an expansion of the PWM project.
- M1W estimates that water from an expanded PWM project would cost approximately $2,500/AF. This is the same cost as estimated for water produced by the 3,500 AFY PWM project.
- Before going further on pursuing an expansion, M1W will wait for CPUC approval of Cal Am's desalination plant, so that expanding the PWM project will not hinder progress on the desalination plant.

Subsequent to that informational workshop, M1W has reported that based on the CPUC ruling last month, which approved Cal Am's Monterey Peninsula Water Supply Project including 3,500 AFY of PWM water, Cal Am has 180 days from the date of the CPUC's decision to file a Tier 2 advice letter providing specific additional information and its assessment as to whether it intends to file an application with the Commission to pursue a Water Purchase Agreement (WPA) for additional water supply to be provided by a PWM expansion. M1W is waiting for Cal Am to take that PUC action before doing anything further.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	Nonmember 21, 2018
AGENDA ITEM:	2.E
AGENDA TITLE:	Results from Martin Feeney's September 2018 Induction Logging of the Sentinel Wells
PREPARED BY:	Robert Jaques, Technical Program Manager

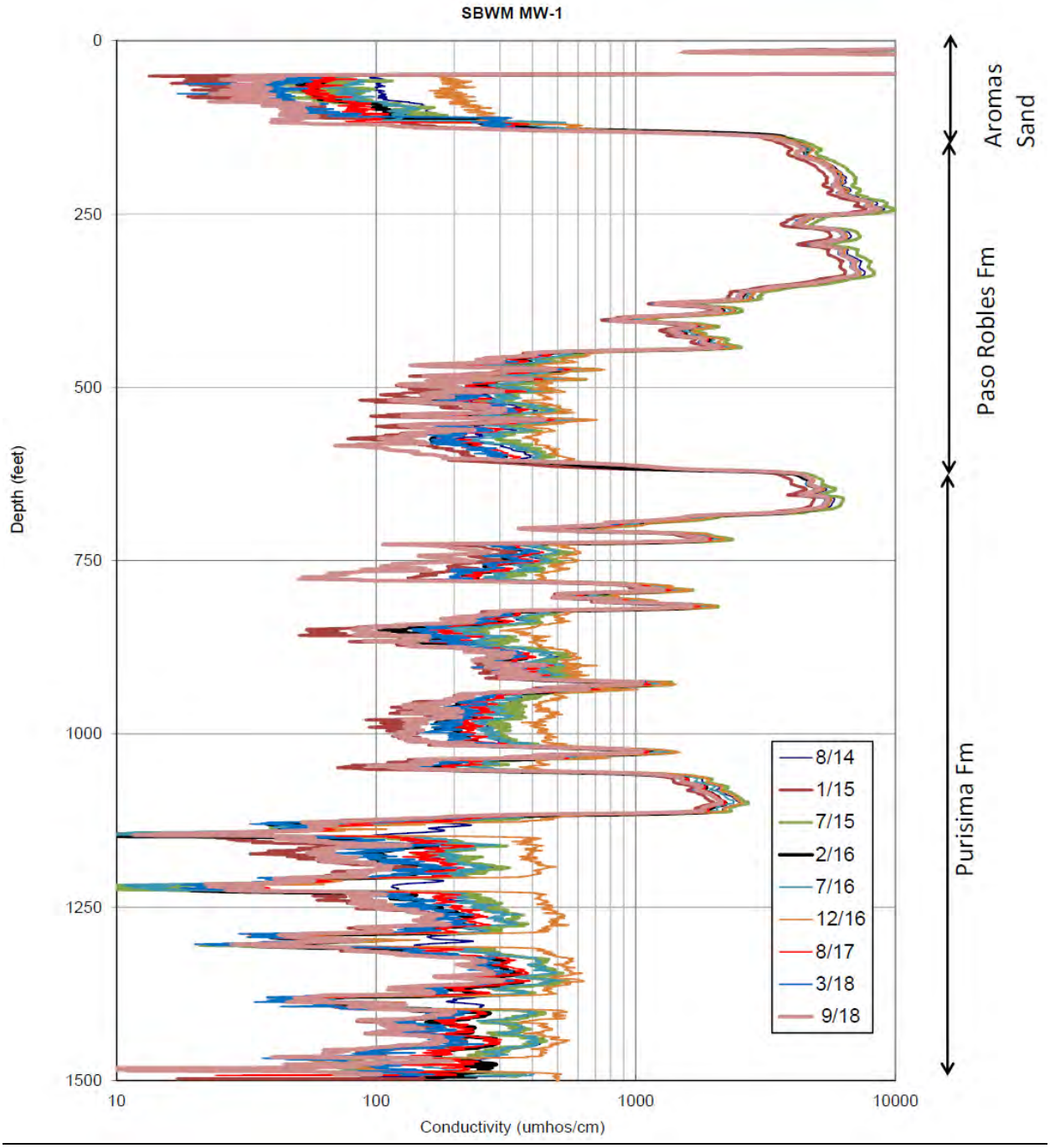
Attached are plots of the induction logging data from the September 2018 Sentinel Well logging event.

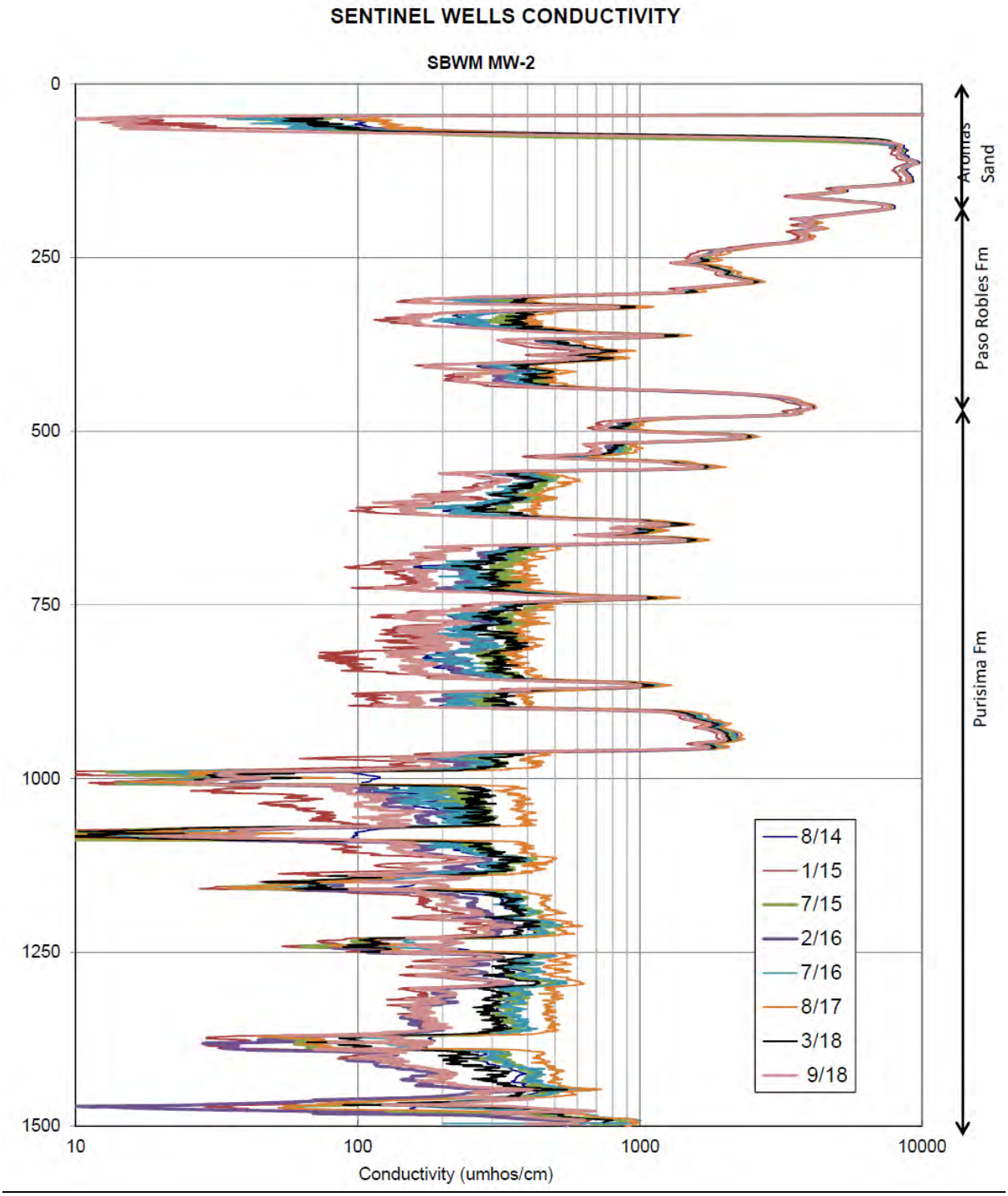
His analysis is that the data from the September 2018 induction logging of the Sentinel Wells reveal the new traces to be within the bounds of previous data. There is no evidence of increasing salinity (conductivity) , if anything the formation fluid reads a little fresher. However, the observed freshening is within the error band of the induction tool.

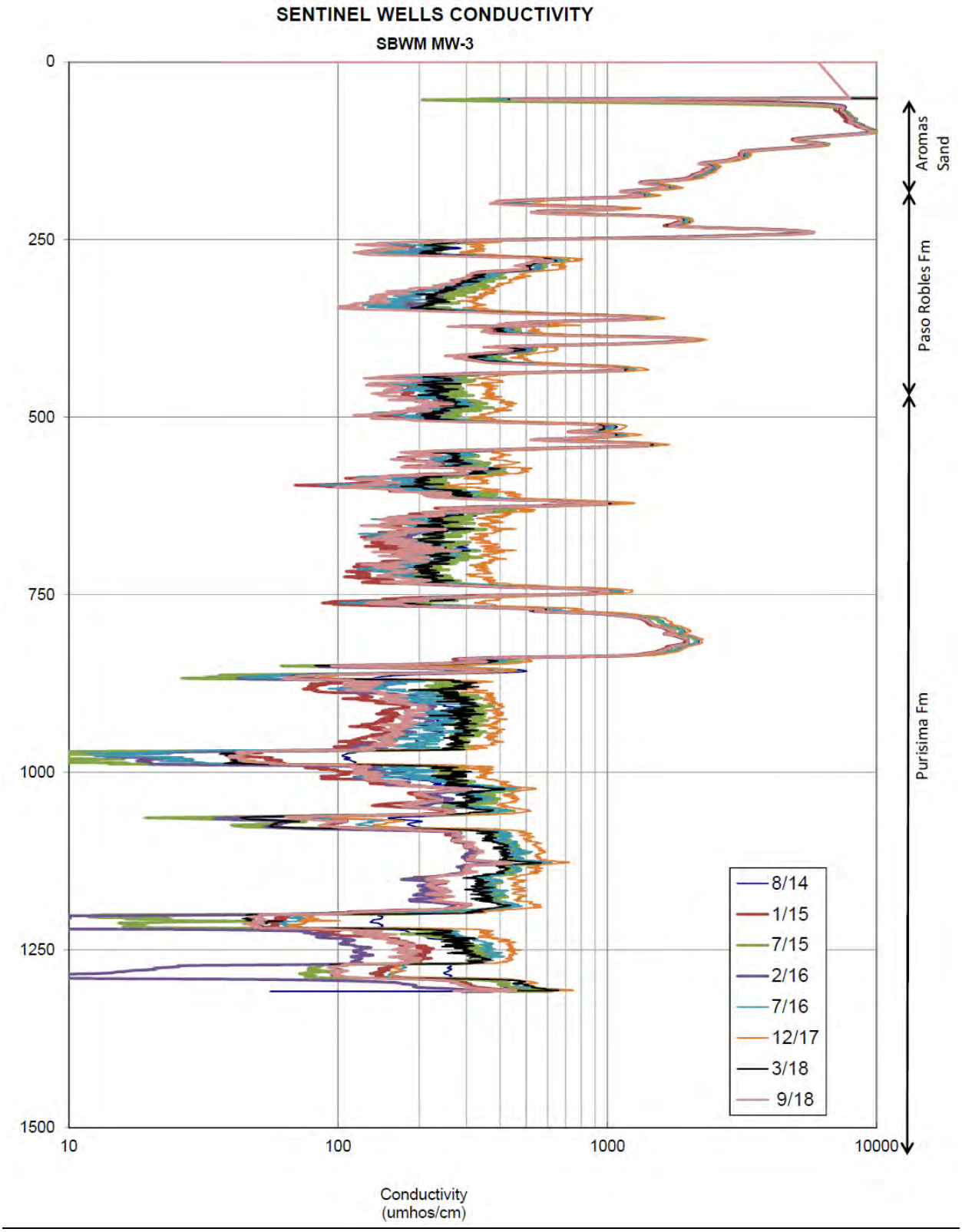
Thus, the induction logging does not show any indication of the start of seawater intrusion in any of the formations within which production wells are located (primarily the Paso Robles and Santa Margarita formations).

ATTACHMENTS:	Induction Logging Results
RECOMMENDED ACTION:	None required – information only

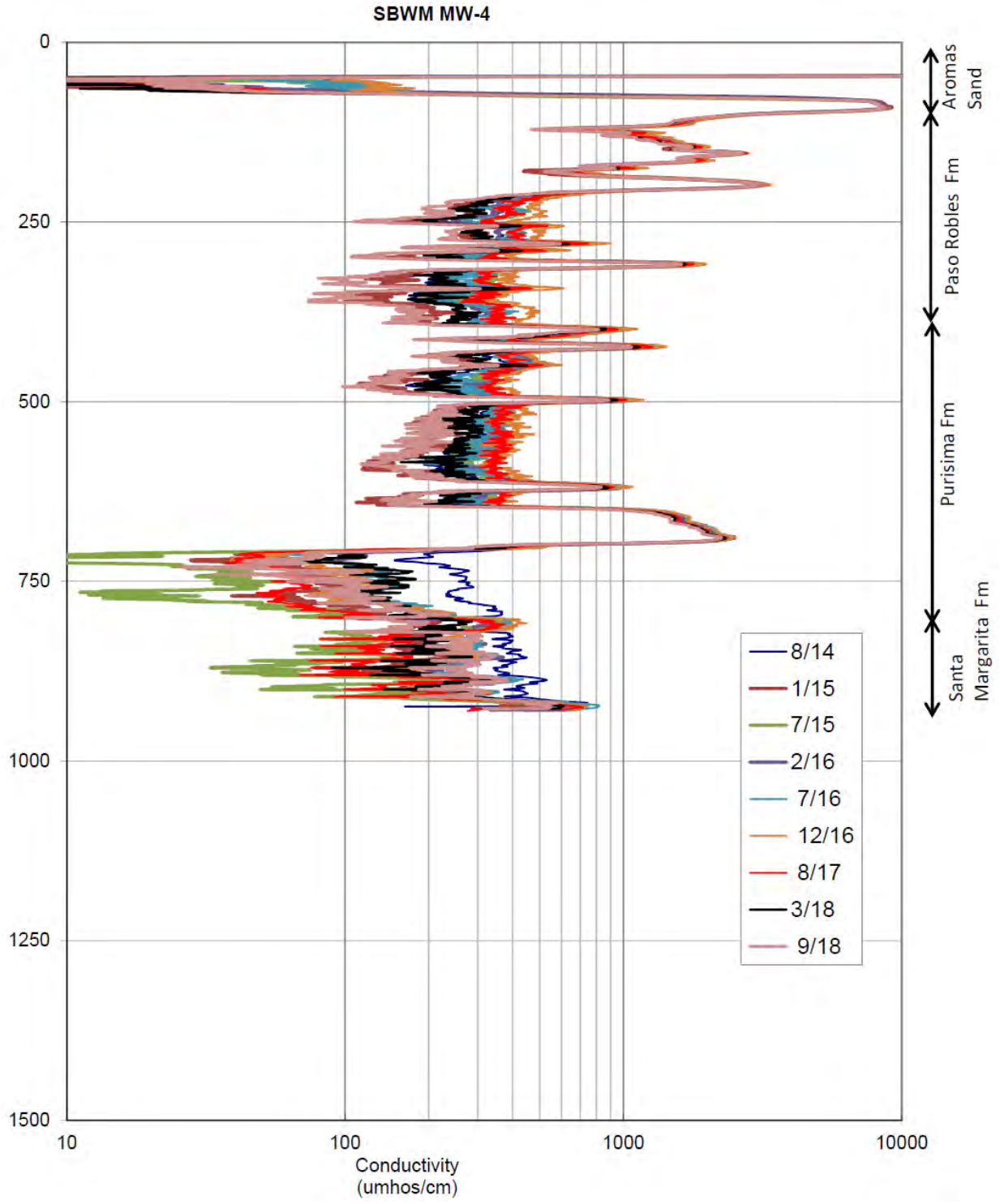
SENTINEL WELLS CONDUCTIVITY




SENTINEL WELLS CONDUCTIVITY
SBWM MW-2
0
250
500
750
1000
1250
1500
10
100
1000
10000
Conductivity (umhos/cm)
Aromas Sand
Paso Robles Fm
Purisima Fm
8/14
1/15
7/15
2/16
7/16
8/17
3/18
9/18


SENTINEL WELLS CONDUCTIVITY
SBWM MW-3
0
250
500
750
1000
1250
1500
10
100
1000
10000
Conductivity
(umhos/cm)
Aromas
Sand
Paso Robles Fm
Purisima Fm
8/14
1/15
7/15
2/16
7/16
12/17
3/18
9/18

SENTINEL WELLS CONDUCTIVITY



SEASIDE BASIN WATER MASTER TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	Nonmember 21, 2018
AGENDA ITEM:	2.F
AGENDA TITLE:	Progress Report on Geochemical Modeling
PREPARED BY:	Robert Jaques, Technical Program Manager

The following is a progress report from Jon Lear as of October 2018 on the geochemical modeling that is being performed by MPWMD's consultant, Pueblo Water Resources.

The goal of this work is to investigate the likely geochemical reactions and reaction mechanisms which may occur when the currently proposed Aquifer Recharge Projects (ARP's) come online and provide direct recharge to the Santa Margarita Sandstone (Tsm) aquifer. The ARP's include the existing Carmel River ASR project (ASR wells 1-4), The Pure Water Monterey (PWM) recycled effluent project, and the Monterey Peninsula Water Supply Project (MPWSP) which will provide desalinated water to the Peninsula. These 3 waters will intermix with native Tsm groundwater (NGW); therefore the potential for adverse (or beneficial) geochemical reactions may exist.

Initial review of the available data from the ARP's indicated less-than-adequate information for purposes of direct geochemical modeling work. Project progress to date has therefore focused on filling data gaps and obtaining complete mineralogical data on the Tsm formation.
Current work on data compilation includes the following:

1- Sample collection and analysis of the effluent from the PWM pilot facility is being analyzed for both base water quality constituents and bench-scale testing for leaching potential with Tsm mineral samples recently obtained from the construction of the PWM DIW2 well.

2- The bench scale protocol described above is also being repeated using treated, potable Carmel River water from the Cal-Am BIRP plant to further assess findings from 2009 testing of the CR-BIRP supplies. This will also be used in the overall geochemical assessment.

3- Tsm cuttings collected from the PWM DIW2 well are being analyzed by both XRD and conventional mineralogy assessment, and are being further analyzed via complete acid digestion to quantify the presence and composition of trace metals within the Tsm matrix. Results of this assessment may lead to further analysis via Dynamic SIMS analysis to further identify mineral compositions prior to geochemical interaction modeling.

It is anticipated that results from these tests will be available in the next 4-6 weeks, at which time modeling will proceed.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	Nonmember 21, 2018
AGENDA ITEM:	2.G
AGENDA TITLE:	Change in Monitoring Well
PREPARED BY:	Robert Jaques, Technical Program Manager

Jon Lear reports that in the past the water quality sample from the PCA West Deep well was used as a proxy for the Security National Guaranty Inc. (S&G) well because it was not active. Now that the S&G well is active, MPWMD should be sampling that well. He went on to say that this would enable determining if the PCA West Deep well is actually an appropriate proxy sample.

He would like to discuss making this change with the TAC at today's meeting.

ATTACHMENTS:	None
RECOMMENDED ACTION:	Concur with Mr. Lear's suggestion or provide other direction to the Technical Program Manager

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE
** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	3
AGENDA TITLE:	Approve Initial RFSs for MPWMD, Montgomery & Associates, Todd Groundwater, and Martin Feeney for 2019
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY: Attached are the proposed initial contracts for each of the Watermaster's consultants that are expected to work on M&MP activities during 2019. Each of these consultants are currently working under a master form of agreement with the Watermaster called a "Professional Services Agreement" (PSA). Actual work assignments are made through the issuance of Requests for Service (RFS) under the umbrella language of the PSA. The attached RFSs constitute the proposed initial 2019 work assignments for each of these consultants as follows:

- Montgomery & Associates RFS No. 2019-01 covering their providing general hydrogeologic consulting services and for providing assistance in preparing documents that the Watermaster will need to submit to fulfill its reporting requirements under the Sustainable Groundwater Management Act.
- Montgomery & Associates RFS No. 2019-02 covering their preparing the 2019 SIAR.
- MPWMD RFS No. 2019-01 covering their anticipated 2019 M&MP tasks. The differences in the tasks anticipated in 2019 compared to 2018 were discussed in a prior TAC meeting and were included in the approved 2019 M&MP. These tasks are similar to those in preceding years.
- MPWMD RFS No. 2019-02 covering their obtaining water quality and water level data from private producers who ask the Watermaster collect this data for them. The costs for this work are reimbursed by the private producers, and there is no net cost to the Watermaster for work performed under this RFS.
- Martin Feeney RFS No. 2019-01 covering his performing induction logging of certain of the Watermaster's monitoring wells and providing that data as well as water quality data to MPWMD for their use in preparing the 2019 Water Quality and Water Level Report. The differences from 2019 compared to 2018 are the result of discontinuing water quality sampling in the Sentinel Wells, as discussed at prior TAC meetings, and as included in the approved 2019 M&MP.
- Martin Feeney RFS No. 2019-02 covering his providing general hydrogeologic consulting services.
- Todd Groundwater RFS No. 2019-01 covering their providing general hydrogeologic consulting services.

These consultants have reviewed the cost and scope details of these proposed contracts and their input has been included in the attached versions of the contracts. The 2019 RFSs to Montgomery & Associates reflect small increases in hourly rates for some of the personnel working on them.

If the geochemical modeling being performed in 2018 and potentially into early 2019 indicates the need to develop mitigation measures for possible adverse impacts from introducing non-native water into the Basin from the Monterey Peninsula Water Supply Project's desalination plant, the Pure Water Monterey Project's groundwater replenishment, or additional ASR water, I will develop an additional RFS for Montgomery & Associates during 2019 to use the Seaside Basin Groundwater Model to provide information to MPWMD's consultant (Pueblo Water Resources) that is preparing the Seaside Basin geochemical model for use in developing such mitigation measures. Funds for this additional RFS have been included in the Board-approved M&MP Operations Budget for 2019. When and if drafted, the RFS would come to the TAC for approval before

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE
**** * * AGENDA TRANSMITTAL FORM * * ****

Agenda Item	3 (continued)

going to the Board.

These contracts are on today's agenda to provide the TAC with the opportunity to raise questions or make suggestions for changes to the scopes-of-work or costs, before they are presented to the Board for approval at the Board's December 5, 2018 meeting, to ensure the contacts can be in effect at the start of 2019.

ATTACHMENTS:	7 - Proposed Consultant Contracts for FY 2019 (2 RFSs – Montgomery & Associates, 2 RFSs – MPWMD, 2 RFSs – Martin Feeney, 1 RFS – Todd Groundwater)
RECOMMENDED ACTION:	Discuss and either modify or approve the proposed contracts

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2019 **RFS NO**. 2019-01
(To be filled in by WATERMASTER)

TO: Hale Barter **FROM**: Robert Jaques
Montgomery & Associates WATERMASTER
PROFESSIONAL

Services Needed and Purpose: General hydrogeologic consulting and document preparation services. See Scope of Work in Attachment 1.

Completion Date: All work of this RFS shall be completed not later than December 31, 2019, and shall be performed in accordance with the Schedule contained in Attachment 2.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $ 13,000.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 1 for Estimated Costs).

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date: _____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date: _____.
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK

On an ongoing and as-requested basis, PROFESSIONAL will provide general hydrogeologic consulting services to WATERMASTER on a variety of topics. These may include, but not be limited to interpretation of water level and water quality data collected by WATERMASTER, BMAP and SIRP implementation issues, and preparation of documents for WATERMASTER's use in fulfilling its Sustainable Groundwater Management Act reporting requirements.

Providing these services will likely involve attending certain of WATERMASTER's Technical Advisory Committee (TAC) meetings, most of which will be attended telephonically. These TAC meetings do not include special TAC or other meetings which may be required as part of performing other work which may be authorized under other RFSs issued to PROFESSIONAL by WATERMASTER. Any such other scope and cost proposals will incorporate costs for those meetings.

The Tasks in WATERMASTER's 2019 Monitoring and Management Program (M&MP) to which this RFS No. 2019-01 pertains are:

M. 1. c & M.1. d - Preparation and Attendance of Meetings
M. 1. e - Peer Review of Documents and Reports
M.1.g – Sustainable Groundwater Management Act Documentation Preparation

ESTIMATED COSTS

Tasks M.1.c, M.1.d, and M.1.e: General Consulting Services will consist of working on these Tasks and attending some TAC and other meetings either via telephone or in-person in Seaside, as requested by WATERMASTER.

$10,000 in labor costs of this RFS No. 2019-01 are allocated to performing work on these Tasks. In addition to hourly labor costs, an allowance of $1,000.00 is included in for this Task to cover travel and other incidental costs associated with the performance of this work.

Task M.1.g: Section 10720.8 of the Sustainable Groundwater Management Act (SGMA) requires adjudicated basins to submit annual reports. Most of the documentation that needs to be reported is already generated by the WATERMASTER in conjunction with preparing its own Annual Reports. However, information regarding changes in basin storage is not currently generated. PROFESSIONAL will provide an estimate of the change in basin storage under this RFS No. 2019-01.

$2,000 in labor costs of this RFS No. 2019-01 are allocated to performing work for Task M.1.g.

All work under this RFS No. 2019-01 will be billed at the following hourly rates, including all markups and other direct costs:

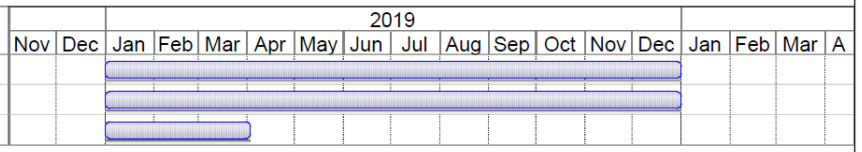
Derrik Williams = $225.00/hour Georgina King = $200.00/hour

The total cost authorized by this RFS No. 2019-01 is $13,000.00.

ATTACHMENT 2
SCHEDULE

Montgomery & Associates RFS No. 2019-01
Work Schedule

ID	Task Name
1	**M. 1. c - Preparation and Attendance of Meetings**
2	**M. 1. e - Peer Review of Documents and Reports**
3	**M.1.g - SGMA Document Preparation**



Montgomery Work Schedule for RFS No 2019-01 10-12-18.mpp

Page 1

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: 1/1/2019 **RFS NO**. 2019-02
(To be filled in by WATERMASTER)

TO: Hale Barter **FROM**: Robert Jaques
Montgomery & Associates WATERMASTER
PROFESSIONAL

Services Needed and Purpose: Prepare the Seawater Intrusion Analysis Report for 2019. See Scope of Work in Attachment 1.

Completion Date: All work of this RFS shall be completed not later than December 31, 2019, and shall be performed in accordance with the Schedule contained in Attachment 2.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $ 21,100.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 3 for Detailed Breakdown of Estimated Costs).

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date: _____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date: _____.
PROFESSIONAL

ATTACHMENT 1

SCOPE OF WORK

The scope consists of providing professional consulting services to WATERMASTER for preparation of the 2019 Seawater Intrusion Analysis Report (SIAR).

To promote efficiency, much of the text and graphics from the 2018 SIAR will be incorporated directly into the 2019 SIAR.

Preparing the 2019 SIAR will involve analyzing all water quality data at the end of Water Year 2019 (October 1, 2018 to September 30, 2019) and producing semi-annual (2^{nd} and 4^{th} quarters 2019) chloride concentration maps for each aquifer in the Basin. Time series graphs, trilinear graphs, and stiff diagram comparisons will be updated with new data. Second and fourth quarter groundwater elevation maps will also be produced. The annual EM logs will be analyzed to identify changes in seawater wedge locations. A determination of whether there is any evidence of seawater intrusion will be made, and recommendations will be included as warranted.

A Draft 2019 SIAR will be provided to WATERMASTER in electronic (not printed) form for review. WATERMASTER will provide its review comments and those of its TAC members through direct discussions with PROFESSIONAL at a TAC meeting. In addition to these oral comments, some TAC members may also provide recommended editorial changes electronically directly to PROFESSIONAL. These comments will be addressed in a Final 2019 SIAR. A CD containing an electronic version of the entire Final 2019 SIAR in MS Word and up to 15 printed and bound copies of the Final 2019 SIAR (quantity to be determined by WATERMASTER) will be provided to WATERMASTER.

ATTACHMENT 2

Montgomery & Associates RFS No. 2019-02
Work Schedule

ID	Task Name	2019												2020					
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Ju
1	**I.4.c Annual Seawater Intrusion Analysis Report (SIAR)**																		
2	HydroMetrics Provides Draft SIAR to Watermaster											◆ **11/12**							
3	TAC Approves Annual Seawater Intrusion Analysis Report (SIAR)											◆ **11/20**							
4	Board Approves Annual Seawater Intrusion Analysis Report (SIAR)												◆ **12/4**						

Montgomery RFS No 2019-02 Work Schedule 10-12-18.mpp Page 1

ATTACHMENT 3

DETAILED BREAKDOWN OF ESTIMATED COSTS

Task	Hours		Costs			
2019 Seawater Intrusion Analysis Report	**Georgina King ($200 per hr)**	**Nick Byler ($120 per hr)**	**Georgina King**	**Nick Byler**	**Expenses**	**Total Costs**
Produce 2019 SIAR	32	100	$ 6,400	$ 12,000	$ 500	$ 18,900
Attend One TAC Meeting in Monterey	10	0	$ 2,000	$ -	$ 200	$ 2,200
TOTALS	**42**	**100**	**$ 8,400**	**$ 12,000**	**$ 700**	**$ 21,100**

Note: Regardless of the use of the term "Estimated Cost" in this RFS, if the work of this RFS is to be compensated for using Lump Sum Payment method, it is understood and agreed to by PROFESSIONAL that the Total Price listed on page 1 of this RFS is binding and limiting as defined in Section V of the Agreement.

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2019

RFS NO. 2019-01 .
(To be filled in by WATERMASTER)

TO: Jonathan Lear
Monterey Peninsula Water Management District
PROFESSIONAL

FROM: Robert Jaques .
WATERMASTER

Services Needed and Purpose:
Perform certain Tasks contained within the Watermaster's Monitoring and Management Plan for 2019 (See detailed Scope of Work in Attachment 1).

Completion Date: The work of this RFS No. 2019-01 shall be completed in accordance with the schedule contained in Attachment 2.

Method of Compensation: Time and Expense Payment Method (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $ 50,024.00 (See Attachment 3 for a Breakdown of this Total Price. Cost is authorized only when evidenced by signature below.)

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date:_____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date:_____.
PROFESSIONAL

ATTACHMENT 1

Detailed Scope of Work for RFS No. 2019-01

Background:

The Watermaster Board approved the Budget for the 2019 Monitoring and Management Program (hereinafter referred to as the "2019 M&MP") at its meeting of October 3, 2018.

This RFS No. 2019-01 authorizes PROFESSIONAL to perform certain work on certain of the Tasks described in the 2019 M&MP. The Task numbers listed in Table 1 of this Detailed Scope of Work for RFS No. 2019-01 correspond to the Task numbers in the 2019 M&MP.

Table 1

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. a.1	Conduct ongoing data entry/ database maintenance	PROFESSIONAL will perform water production, water level, and water quality data entry into WATERMASTER's database, and data editing as necessary, and will provide appropriate quality control and quality assurance for this data. Upon request from WATERMASTER, PROFESSIONAL will also enter other data into the database, such as updated information pertaining to well records. WATERMASTER will provide PROFESSIONAL with water production data. PROFESSIONAL will review the water production data provided by WATERMASTER for quality assurance and quality control purposes, and will notify WATERMASTER of any discrepancies PROFESSIONAL observes in this data. WATERMASTER will follow-up as appropriate with the water producers to resolve any such discrepancies. PROFESSIONAL will also host and maintain the Watermaster's Database. Any changes to WATERMASTER's database will be authorized under a separate agreement for performing such work for WATERMASTER. That agreement will either be with PROFESSIONAL or with another consultant. PROFESSIONAL will prepare quarterly water production, water level, and water quality tabulations in Excel format and will provide those tabulations to another WATERMASTER Consultant who will post them to the WATERMASTER's website, so it will be accessible to the public and other interested parties.

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. b. 2	Collect Monthly Water Levels	The monitoring wells from which water level data is to be collected by PROFESSIONAL are listed under the heading "MONITORING TO BE PERFORMED BY PROFESSIONAL" in the column titled "Level" in Table 2. PROFESSIONAL will visit each of the indicated wells at the frequencies shown in Table 2 in order to obtain the water level data. At these visits PROFESSIONAL will measure and record water levels by either taking manual water levels using an electric sounder, or by dataloggers. The wells where the use of dataloggers is feasible or appropriate have already been equipped with dataloggers. This Task includes the purchase of one datalogger @ $700 to keep in inventory as a spare if needed, plus $50 in parts for the datalogger. All of the other wells will be manually measured.

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. b. 3	Collect Quarterly Water Quality Samples	The monitoring wells from which water quality data is to be collected by PROFESSIONAL are listed under the heading "MONITORING TO BE PERFORMED BY PROFESSIONAL" in the column titled "Quality" in Table 2. PROFESSIONAL will visit each of the indicated wells at the frequencies shown in Table 2 in order to obtain the water quality samples, and will perform water quality analyses on these samples. The water quality constituents that will be measured in these analyses are: Specific Conductance (micromhos/cm), Total Alkalinity (as $CaCO_3$), Bicarbonate (as HCO_{3-}), pH, Chloride, Sulfate, Ammonia Nitrogen (as NH_3), Nitrate Nitrogen (as NO_3), Total Organic Carbon, Calcium, Sodium, Magnesium, Potassium, Iron, Manganese, Orthophosphate, Total Dissolved Solids, Hardness (as $CaC0_3$), Boron, Bromide, and Fluoride. For the following wells listed in Table 2, Barium and Iodide will also be measured quarterly: MSC Shallow, MSC Deep, PCA-W Shallow, PCA-W Deep, MPWMD #FO-09 Shallow, and MPWMD #FO-09 Deep. The data may either come from water quality samples that are collected by the airlift method, by the positive displacement method during induction logging of these wells and/or other data gathering techniques, or combinations of these methods, at the discretion of PROFESSIONAL, and will be submitted to a State-certified analytical laboratory for analysis. Retrofitting to use the low-flow purge approach for getting water quality samples has already been completed on all of the wells that are sampled on a quarterly basis. Retrofitting of the wells that are sampled on an annual basis is not warranted. This sampling equipment sits in the water column and may periodically need to be replaced or repaired. Accordingly, an allowance of $1,000 to perform maintenance on previously installed equipment has been included in this Task. Also, in the event a sampling pump is found to be no longer adequate due to declining groundwater levels, or if a sampling pump needs to be installed on a Sentinel Well, an allowance of $2,000 to purchase a sampling pump has been included in this Task.

M&MP TASK NO.	TASK DESCRIPTION	WORK TO BE PERFORMED
I. 2. b. 6	Reports	PROFESSIONAL will prepare and submit reports to WATERMASTER according to the following schedule: 1. PROFESSIONAL will review the water quality and water level data at the end of each quarter of the Water Year and will provide tabularized data summaries of the WQ/WL data twice per year, once for the Q1 and Q2 period and once for the Q3 and Q4 period, so this data can be posted to WATERMASTER's website. No reporting on a quarterly basis is required but PROFESSIONAL will promptly notify WATERMASTER of any missing data or data collection irregularities that were encountered during the quarterly reporting period. 2. PROFESSIONAL will prepare one annual report summarizing the water quality and water level data for the Water Year, and containing tables of this data for the complete Water Year. The report will include a brief cover letter describing any missing data or data collection irregularities that were encountered during the reporting period, and any recommendations for changes to be made to the data collection program.
I.2.b.7	CASGEM Data Submittal	PROFESSIONAL will compile and submit data on the Watermaster's "Voluntary Wells" into the State's CASGEM groundwater management database. The term "Voluntary Well" refers to a well that is not currently having its data reported into the CASGEM system, but for which the Watermaster obtains data. This will be done in the format and on the schedule required by the Department of Water Resources under the Sustainable Groundwater Management Act.
I.4.c	Review Seawater Intrusion Analyses	WATERMASTER will have another consultant perform analyses and prepare mapping and other documents pertaining to seawater intrusion detection. PROFESSIONAL may participate in meetings with that consultant during the course of its work, and may provide review comments and recommendations to WATERMASTER regarding this work as it is being carried out by that consultant.

Table 2. Monitoring Wells

WELL NAME AND SUBAREA LOCATION[8]	MONITORING NETWORK[1]		MONITORING REQUIRED BY DECISION[2]		MONITORING CURRENTLY BEING PERFORMED BY PROFESSIONAL NOT SUBJECT TO THIS RFS[3]		MONITORING TO BE PERFORMED BY PROFESSIONAL UNDER THIS RFS[4]			
					Level		Level		Quality	
					Frequency		Frequency		Frequency	
	Professional's	Watermaster's	Level (Monthly)	Quality (Annually)	Monthly	Quarterly	Monthly	Quarterly	Annually	Quarterly
Northern Coastal Subarea (and vicinity)										
MSC-Shallow		X					X			X
MSC-Deep		X					X			X
PCA-W Shallow		X						X		X
PCA-W Deep		X						X		X
PCA-E (Multiple) Shallow	X				X				X	
PCA-E (Multiple) Deep	X				X				X	
Ord Grove Test-Shallow /Deep	X				X					
Paralta Test-Shallow /Deep	X				X					
Ord Terrace-Shallow	X				X				X	
Ord Terrace-Deep	X				X				X	
MPWMD #FO-09-Shallow	X				X					X
MPWMD #FO-09-Deep	X				X					X
MPWMD #FO-10-Shallow		X					X		X	
MPWMD #FO-10-Deep		X					X		X	
Fort Ord Monitor MW-B-23-180-Dune/Aromas		X					X		X	
CDM MW-1-Dune/Aromas		X					X			
CDM MW-2-Dune/Aromas		X					X			
CAW Del Monte Observation-Shallow		X							X	
SBWM MW-1-Deep (Purisima)[6]		X						X		
SBWM MW-2-Deep (Purisima)[6]		X						X		
SBWM MW-3-Deep (Purisima)[6]		X						X		
SBWM MW-4-Deep (Purisima/Santa Margarita)[6]		X						X		
Northern Inland Subarea (and vicinity)										
MPWMD #FO-01-Shallow	X					X				
MPWMD #FO-01-Deep	X					X				
MPWMD #FO-07-Shallow	X					X				
MPWMD #FO-07-Deep	X					X				
MPWMD #FO-08-Shallow	X					X				
MPWMD #FO-08-Deep	X					X				
MPWMD #FO-11-Shallow	X					X				
MPWMD #FO-11-Deep	X					X				
SBWM MW-5-Shallow (Paso Robles)[6]		X						X	X	
SBWM MW-5-Deep (Santa Margarita)[6]		X						X	X	

Table 2 (Continued)

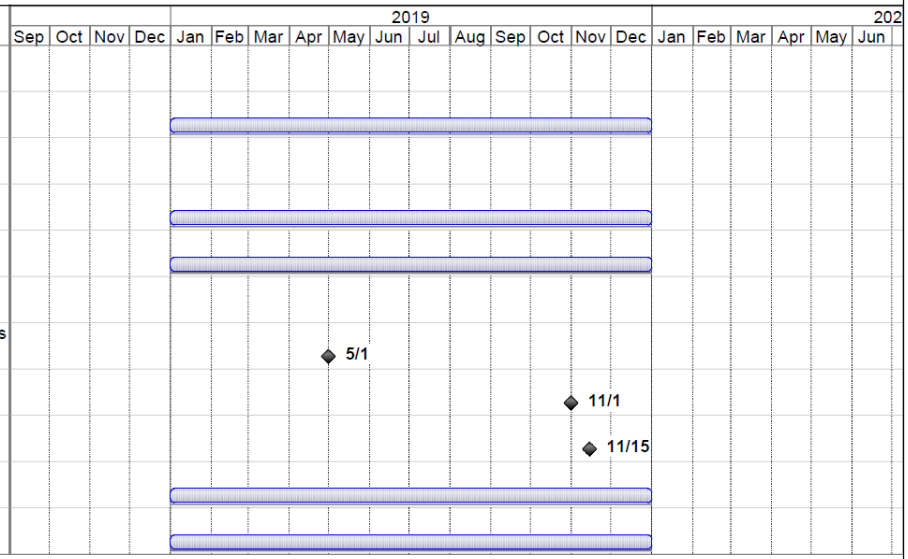
Southern Coastal Subarea (and vicinity)										
Plumas '90 Test-Deep		X					X			
K-Mart-Dune/Aromas		X					X			
CDM MW-3-Dune/Aromas		X					X			
CDM MW-4-Dune/Aromas		X					X			
MW-BW-08A-Dune/Aromas		X					X			
MW-BW-09-180-Shallow		X					X			
Shea		X						X		
Sand City Public Works Well		X					X		X	
Laguna Seca Subarea (and vicinity)										
MPWMD #FO-03-Shallow	X					X				
MPWMD #FO-03-Deep	X					X				
MPWMD #FO-04-Shallow (E)	X					X				
MPWMD #FO-04-Deep (W)	X					X				
MPWMD #FO-05-Shallow	X					X				
MPWMD #FO-05-Deep	X					X				
MPWMD #FO-06-Shallow	X					X				
MPWMD #FO-06-Deep	X					X				
Justin Court (RR M2S)-Shallow	X					X				
LS Pistol Range (Mo Co TH-1)-Deep	X					X				
York Rd-West (Mo Co MW-1 D)-Deep	X					X				
Seca Place (Mo Co MW-2)-Deep	X					X				
Robley Shallow (North) (Mo Co MW-3S)-Shallow	X					X				
Robley Deep (South) (Mo Co MW-3D)-Deep	X					X				
LS No. 1 Subdivision-Deep	X					X				
Blue Larkspur-East End-Believed to be Deep	X					X				
York School-Shallow		X	X						X	
Laguna Seca Driving Range (SCS-Deep)-Shallow		X						X	X	
Laguna Seca County Park #2-Shallow		X	X						X	
CAW Granite Construction-Deep		X					X			
CAW Ryan Ranch (RR) #7-Deep		X	X						X	
Laguna Seca Golf New #12-Deep[9]		X							X	
Pasadera Main Gate-Deep		X	X						X	
No. of Wells in Each Network[5]=	32	31	4	0	8	24	15	10	17	6

Notes:
(1) The wells within the Professional's Monitoring Well Network are the wells that PROFESSIONAL monitors as part of PROFESSIONAL's own monitoring program. The wells within the Watermaster's Monitoring Well Network are the wells to be monitored under this RFS.
(2) Monitoring required by the Decision is the monitoring described in the Monitoring and Management Program which was incorporated by reference in the Decision of the Court dated February 9, 2007.
(3) Monitoring currently being performed by PROFESSIONAL not subject to this RFS is monitoring work PROFESSIONAL is performing under other monitoring programs. This monitoring is not a part of this RFS.
(4) Monitoring to be performed by PROFESSIONAL is the monitoring to be performed under this RFS.
(5) The Watermaster's Monitoring Well Network includes the wells recommended in the Enhanced Monitoring Well Network report prepared by PROFESSIONAL, dated October 23, 2007, plus the 4 new Sentinel Wells installed in 2007 and the BLM well installed in 2011.
(6) The Seaside Basin Watermaster (SBWM) wells are all equipped with dataloggers that obtain measurements at least daily, but will be manually sounded for water level on a quarterly basis for calibration purposes.
(7) Not used.
(8) Shallow=Paso Robles; Deep=Santa Margarita or Purisima.
(9) This well is so close to the Laguna Seca Old No. 12 well that no water level monitoring is necessary.
(10) CAW East Fence Shallow well can no longer be sampled and was therefore dropped from this list.

ATTACHMENT 2
SCHEDULE

MPWMD RFS No. 2019-01 Work Schedule

ID	Task Name
1	**I.2.a DATABASE MANAGEMENT**
2	**I.2.a.1 Conduct Ongoing Data Entry/Database Maintenance**
3	**I.2.b DATA COLLECTION PROGRAM**
4	**I.2.b.2 Collect Monthly Water Levels (MPWMD)**
5	**I.2.b.3 Collect Quarterly Water Quality Samples (MPWMD)**
6	**I.2.b.6 Reports (from MPWMD)**
7	Water Level and Water Quality Data Summaries for 1st & 2nd Quarters
8	Water Level and Water Quality Data Summaries for 2nd & 3rd Quarters
9	Annual Water Production, Water Level, and Water Quality Report for 2019
10	**I.2.b.7 CASGEM Data Submittal**
11	**I.4.c MPWMD Provides Assistance in Seawater Intrusion Detection**



Work Schedule for MPWMD RFS No 2019-01 7-30-18.mpp

Page 1

ATTACHMENT 3 SUMMARY OF ESTIMATED COSTS

M&MP TASK NO.	LABOR HOURS		HOURLY	SUPPLIES AND MATERIALS		TOTAL
	BREAKDOWN	TOTAL	RATE	BREAKDOWN	TOTAL	
I. 2. a. 1	12 mo. @ 8 hrs/mo.	96	$149	Other services needed to host and maintain Watermaster's Database, estimate $300 for the year.	$300	$14,604
I. 2. b. 2.	12 mo. @ 4 hrs/mo.	48	$62	Purchase one datalogger @ $700 plus $50 in parts to keep in inventory as a spare if needed.	$750	$3,726
I. 2. b. 3.	Quarterly WQ wells (Table 2): MPWMD Coastal wells (6 wells - shallow and deep aquifers @ 3 sites: MSC, PCA-W, FO-09), plus one additional verification WQ sample at Ord Terrace Shallow Well. Labor: 4 events @ 16 hrs/event	64	$62	Fuel: 4 events @ $10/site x 3 sites = $120; Lab costs: 4 events @ $225/well x 7 wells = $6,300; plus one verification sample lab cost = $225.	$6,645	$10,613
	Annual WQ wells (Table 2): 1 event @ 28 hrs/event = 28 hrs	28	$62	BLM site: Eductor setup (use MPWMD portable unit): $0 x 1 site = $0; Airlift equip.: $100 x 1 site x 1 event = $100; Fuel: $20 x 1 site x 1 event = $20. Lab cost (annual WQ wells): $175 x 15 wells x 1 event = $2,625; maintenance on previously installed sample collection equipment = $1,000. One-time cost, if necessary for replacing a well sampling pump if the existing pump is found to be inadequate due to dropping groundwater levels, or if a sampling pump needs to be installed on a Sentinel Well = $2,000.	$5,745	$7,481
	WM Sentinel and Northern Inland wells: download/store dataloggers, 4 events @ 2 hrs/event	8	$62	N/A	$0	$496
	Compile data: 4 events @ 24 hours/event	96	$62	N/A	$0	$5,952
I. 2. b. 6	Data summaries and 1-annual report	24	$149	N/A	$0	$3,576
I.2.b.7	CASGEM Data Submittal for Watermaster's Voluntary Wells	16	$149	N/A	$0	$2,384
I. 4. c	Provide SWI supplemental data and review.	8	$149	N/A	$0	$1,192
					TOTAL ESTIMATED COST =	**$50,024**

Notes:

1. Vehicle mileage is included in the labor costs above.

2. Regardless of the use of the term "Estimated Cost" in this RFS, if the work of this RFS is to be compensated for using Lump Sum Payment method, it is understood and agreed to by PROFESSIONAL that the Total Price listed on page A-1 of this RFS is binding and limiting as defined in Section V of the Agreement.

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2019 **RFS NO**. 2019-01 .
(To be filled in by WATERMASTER)

TO: Martin Feeney **FROM**: Robert Jaques .
Martin Feeney WATERMASTER
PROFESSIONAL

Services Needed and Purpose:
Perform certain Tasks contained within the Watermaster's Monitoring and Management Plan for 2019 (See detailed Scope of Work in Attachment 1).

Completion Date: The work of this RFS No. 2019-01 shall be completed in accordance with the schedule described in Attachment 1.

Method of Compensation: Time and Expense Payment Method (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $ 17,540.56 (See Attachment 2 for a Breakdown of this Total Price. Cost is authorized only when evidenced by signature below.)

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Authorized by: _____ Date: _____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date: _____.
PROFESSIONAL

ATTACHMENT 1

Detailed Scope of Work for RFS No. 2019-01

Background:
The Watermaster Board approved the Budget for the 2019 Management and Monitoring Program Work Plan (hereinafter referred to as the "2019 M&MP Work Plan") at its meeting of October 3, 2018.

Scope of Work
This RFS No. 2019-01 authorizes PROFESSIONAL to perform the work described in PROFESSIONAL's Proposal for Hydrogeologic Services, dated July 19, 2018 and contained in Attachment 2, with the following clarifications and/or additions:

PROFESSIONAL will collect water level data from the wells identified as SBWM-1, SBWM-2, SBWM-3, and SBWM-4. PROFESSIONAL will also perform induction logging on each of these wells. These wells are commonly referred to as WATERMASTER's Sentinel Wells. Water level data collection and induction logging will be performed on each of these wells as described below and according to the schedule described below:

Induction Logging
Induction logging will be performed on each of the four Sentinel Wells semi-annually in March and September.

Water Level
Water levels in each of the four Sentinel Wells will be continuously measured by data loggers and will be downloaded semi-annually when induction logging is being performed.

PROFESSIONAL will transmit the digital water level data to the Monterey Peninsula Water Management District (MPWMD), Montgomery and Associates, and to the WATERMASTER promptly after the data is acquired, so that (1) MPWMD can use that data in preparing its reports to the WATERMASTER and (2) Montgomery and Associates and the WATERMASTER will be made promptly aware of the data. Digital induction data will also be provided to MPWMD, Montgomery and Associates, and to the WATERMASTER as soon as it becomes available to PROFESSIONAL. Digital induction data will also be reduced and presented graphically and provided to Montgomery and Associates for use by Montgomery and Associates in preparing reports for the WATERMATER.

ATTACHMENT 2

Martin B. Feeney
Consulting Hydrogeologist

P.G. 4634
C.E.G. 1454
C.Hg 145

July 19, 2018

Seaside Basin Watermaster
PO Box 51502
Pacific Grove CA.
93950

Attention: Bob Jaques, PE

Subject: Sentinel Well Data Collection Program 2019 – Proposal for Hydrogeologic Services

Dear Bob:

Following up on our discussions, I'm pleased to provide this proposal to assist the Seaside Basin Watermaster (Watermaster) with data collection from the Sentinel Wells for the upcoming year. Presented in this proposal are an outline of the data collection plan and an estimate of associated costs.

The data collection program for the Sentinel Wells will continue as it has been performed the last half of 2017. The data collection program currently includes semi-annual induction logging and continuous water level data collection. The program previously included depth-specific downhole water quality sampling, however the data proved unreliable and this portion of the program was terminated. The subcontractor for the induction logging remains unchanged.

The components of this program are as follows:

Data collection from each well:

- Semi-Annual down-loading of water level data logger.
- Semi-Annual induction logging (March and September)
- Transmittal of water level data to Monterey Peninsula Water Management District personnel.
- Processing of induction log data and presentation

It is understood that, as in the past, the Monterey Peninsula Water Management District (District) will share some of the data collection and analysis tasks of the overall data collection program. The District will collect water level data from the array of data loggers on the alternate quarters. Water level data from the data loggers will be collected as part of this scope of services only when induction logging is performed. Collected water level data will be transmitted to the District for compilation and processing. Induction logging data will continue to be compiled and processed by this author.

Annual costs for the data collection program are estimated at $ 17,541 inclusive of outside services. A breakdown of costs is presented in the table below.

P.O. Box 23240, Ventura, CA 93002 ♦ **Phone: 805/643-7710** ♦ e-mail mfeeney@ix.netcom.com

SENTINEL WELLS LOGGING/SAMPLING WL DATA COLLECTION PROGRAM

2019

Pacific Surveys	Unit Cost	Number	Semi-Annual Cost	# per annum	Annual Cost
Service Charge	1085	1	1085	2	$ 2,170.00
Induction Logging	0.75	5310	3982.5	2	$ 7,965.00
E-file generation/transmittal	115	1	115	2	$ 230.00
mileage	0.99	422	417.78	2	$ 835.56
per diem	175	2	350	2	$ 700.00
					$ 11,900.56
Professional Services					
Supervise Logging/Download Data Loggers	165	10	1650	2	$ 3,300.00
Process Induction Data	195	4	780	2	$ 1,560.00
Transmit Water Level Data	195	2	390	2	$ 780.00
					$ 5,640.00
				Total	$ 17,540.56

The opportunity to present this proposal is appreciated. Please call if you have any questions.

Sincerely,

Martin B. Feeney

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2019 **RFS NO**. 2019-02
(To be filled in by WATERMASTER)

TO: Martin Feeney **FROM**: Robert Jaques
Martin Blair Feeney WATERMASTER
PROFESSIONAL

Services Needed and Purpose: Consultation and other hydrogeologic services. See Scope of Work in Attachment 1.

Completion Date: All work of this RFS shall be completed not later than December 31, 2019.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $4,000.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 1 for derivation of this Total Price).

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date:_____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date:_____.
PROFESSIONAL

ATTACHMENT 1

On an ongoing and as-requested basis, PROFESSIONAL will provide general hydrogeologic consulting services to WATERMASTER on a variety of topics. These may include, but not be limited to, interpretation of water level and water quality data, and seawater intrusion analysis issues.

Providing these services will likely involve attending certain of WATERMASTER's Technical Advisory Committee (TAC) and /or Board meetings, most of which will be attended telephonically.

An allowance for 20 hours of consulting services at $195/hour, plus $100 for related other direct costs (such as travel costs), is hereby authorized by this RFS No. 2019-02 to provide these services. Services under this RFS No. 2019-02 will only be provided when specifically requested by WATERMASTER.

The total cost authorized by this RFS No. 2019-02 is $4,000.

SEASIDE BASIN WATERMASTER
REQUEST FOR SERVICE

DATE: January 1, 2019 **RFS NO**. 2019-01
(To be filled in by WATERMASTER)

TO: Gus Yates
Todd Groundwater
PROFESSIONAL

FROM: Robert Jaques
WATERMASTER

Services Needed and Purpose: See Scope of Work in Attachment 1.

Completion Date: All work of this RFS shall be completed not later than December 31, 2019.

Method of Compensation: Time and Materials (As defined in Section V of Agreement.)

Total Price Authorized by this RFS: $4,000.00 (Cost is authorized only when evidenced by signature below.) (See Attachment 1 for Estimated Costs).

Total Price may not be exceeded without prior written authorization by WATERMASTER in accordance with Section V. COMPENSATION.

Requested by: _____ Date: _____.
WATERMASTER Technical Program Manager

Agreed to by: _____ Date: _____.
PROFESSIONAL

ATTACHMENT 1

Scope of Work

On an ongoing and as-requested basis PROFESSIONAL will provide hydrogeologic consulting services to WATERMASTER on groundwater modeling and related topics. These may include, but not be limited to, responding to questions regarding the Seaside Basin Model that HydroMetrics WRI has prepared for WATERMASTER, assisting in the interpretation of modeling results, and other related activities.

Providing these services may involve attending certain of WATERMASTER's Technical Advisory Committee (TAC) meetings, some of which may be attended telephonically.

Estimated Costs

Consulting services provided under this RFS No. 2019-01, including attending meetings either via telephone or in-person as requested by WATERMASTER, will be billed at PROFESSIONAL's standard hourly rates for calendar year 2019, including all markups and other direct costs.

In addition to hourly labor costs, an allowance of $500.00 is included in the estimated cost of this RFS to cover travel and other incidental costs associated with the performance of this work.

The total cost authorized by this RFS No. 2019-01 is $4,000.00.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	4
AGENDA TITLE:	Discuss and Provide Input on the 2018 Seawater Intrusion Analysis Report (SIAR)
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

Montgomery & Associates has completed preparing the Draft Seawater Intrusion Analysis Report (SIAR) for Water Year 2017-2018 and the Executive Summary, which contains conclusions and recommendations, is attached. The complete Draft SIAR is lengthy, so rather than including it in this agenda packet it was posted on the Watermaster's website so TAC members wishing to review the entire document could do so.

The SIAR examines the "health" of the Basin with regard to whether or not there are any indications that seawater intrusion is either occurring or is imminent. Previous SIARs have stated that depressed groundwater levels, continued pumping in excess of recharge and fresh water inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin. In spite of these factors, the previous SIARs stated that neither the Piper nor the Stiff Diagrams nor any of the other parameters indicated the presence of seawater intrusion in the existing monitoring wells. The 2018 SIAR notes that although changes in chloride concentrations were found at some depths in some of the Sentinel Wells, the evaluation of the data from the sampling and monitoring program continues to indicate that seawater intrusion is <u>not</u> occurring

A representative from Montgomery & Associates will participate in today's TAC meeting via telephone to provide an oral summary of the report and to respond to questions by TAC members.

ATTACHMENTS:	Executive Summary from the Draft 2018 SIAR
RECOMMENDED ACTION:	Discuss and either modify or approve the Draft SIAR and forward the document to the Board with the TAC's recommendation for approval

1 EXECUTIVE SUMMARY

This report fulfills part of the annual reporting requirements contained in the Seaside Groundwater Basin Adjudication (California American Water v. City of Seaside, Monterey County Superior Court, Case Number M66343). The annual report addresses the potential for, and extent of, seawater intrusion in the Seaside Groundwater Basin.

Seawater intrusion may occur in basic hydrogeologic conditions as a wedge beneath fresh groundwater, or in more complex hydrogeology with various intrusion interfaces among the different aquifers. Continued pumping in excess of recharge and fresh water inflows, coastal groundwater levels well below sea level, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin.

Seawater intrusion is typically identified through regular chemical analyses of groundwater which can identify geochemical changes in response to seawater intrusion. No single analysis definitively identifies seawater intrusion, however by looking at various analyses we can ascertain when fresh groundwater mixes with seawater. At low chloride concentrations, it is often difficult to identify incipient seawater intrusion. This is due to the natural variation in fresh water chemistry at chloride concentrations below 1,000 milligrams per liter (mg/L). Mixing trends between groundwater and seawater are more easily defined when chloride concentrations exceed 1,000 mg/L. Common geochemical indicators of seawater intrusion are cation and anion ratios, chloride trends, sodium/chloride ratios, and electric induction logging.

Based on an evaluation of geochemical indicators for Water Year 2018 and prior, no seawater intrusion has historically been or is currently observed in existing monitoring and production wells in the Seaside Groundwater Basin.

Data which indicate that seawater intrusion is not occurring are described in the bulleted items below:

- All groundwater samples for Water Year 2018 from depth-discreet monitoring wells plot generally in a single cluster on Piper diagrams, with no water chemistry changes towards seawater.
- Groundwater quality plot on Piper diagrams in some of the production wells is different than the water quality in the monitoring wells. This may be a result of mixed water quality from both shallow and deep zones in which these wells are

perforated. None of the production wells' groundwater qualities are indicative of seawater intrusion.

- None of the Stiff diagrams for monitoring and production wells show the characteristic chloride spike that typically indicates seawater intrusion in Stiff diagrams.

- Overall, chloride concentration trends were stable for most monitoring wells, with no increases greater than 10 mg/L.

- Sodium/chloride molar ratios in the monitoring wells remained constant or increased over the past year.

- Maps of chloride concentrations for the shallow aquifer do not show chlorides increasing towards the coast. The deep aquifer maps show that higher chloride concentrations are limited to coastal monitoring wells PCA-West Deep and MSC Deep, but these are indicative of seawater intrusion.

- Induction logging data at the coastal Sentinel Wells do not show large changes over time that are indicative of seawater intrusion.

The following groundwater level and production data suggest that conditions in the basin continue to provide a potential for seawater intrusion:

- All deep groundwater in the Northern Coastal subarea is below sea level. The 2nd quarter (winter/spring) deep aquifer coastal groundwater levels are more than 12 feet below sea level and the 4th quarter (summer/fall) levels are more than 25 feet below sea level. These are similar to the historic low levels observed in Water Year 2016 at the end of the recent drought.

- Groundwater levels remain below protective elevations in all deep target monitoring wells (MSC deep, PCA-W, and sentinel well SBWM-3). Currently, only one of the three shallow wells' groundwater levels are above protective elevations: CDM-MW4. Since 1997, PCA-W shallow groundwater levels has been above protective elevations but has just fallen below its protective elevation this fall; probably due to increased shallow aquifer production that started in 2015. As observed historically, MSC shallow groundwater levels remains below protective elevations.

Due to its distance from the coast, seawater intrusion is not an issue of concern in the Laguna Seca subarea. However, groundwater levels in the eastern Laguna Seca subarea have historically declined at rates of 0.6 feet per year in the shallow aquifers, and up to

four feet per year in the deep aquifers. These declines have occurred since 2001, despite triennial reductions in allowable pumping. The cause of the declines is due in part to the Natural Safe Yield of the subarea being too high and in part due to the influence of wells to the east of the Seaside Basin. Since 2014, however, the rate of decline is less and now appears close to stabilizing.

Native groundwater production in the Seaside Groundwater Basin for Water Year 2018 was 3,363.4 acre-feet, which is 314 acre-feet more than Water Year 2017. This amount is 3.4 acre-feet more than the Decision-ordered Operating Yield of 3,360 acre-feet per year that is required between October 1, 2017 and September 30, 2020.

Based on the findings of this report, there are no specific recommendations that relate to the collection of groundwater data from existing wells used in the seawater intrusion analysis, other than to continue analyzing and reporting on groundwater quality, groundwater levels, and production each year. However, as projects that recharge and recover water into the Basin are implemented, groundwater levels and thus groundwater flow directions will change, and possibly groundwater quality too. It is important that data from new monitoring wells are reported to the Watermaster and taken into consideration in future SIARs.

SEASIDE GROUNDWATER BASIN

2018 SEAWATER INTRUSION ANALYSIS REPORT

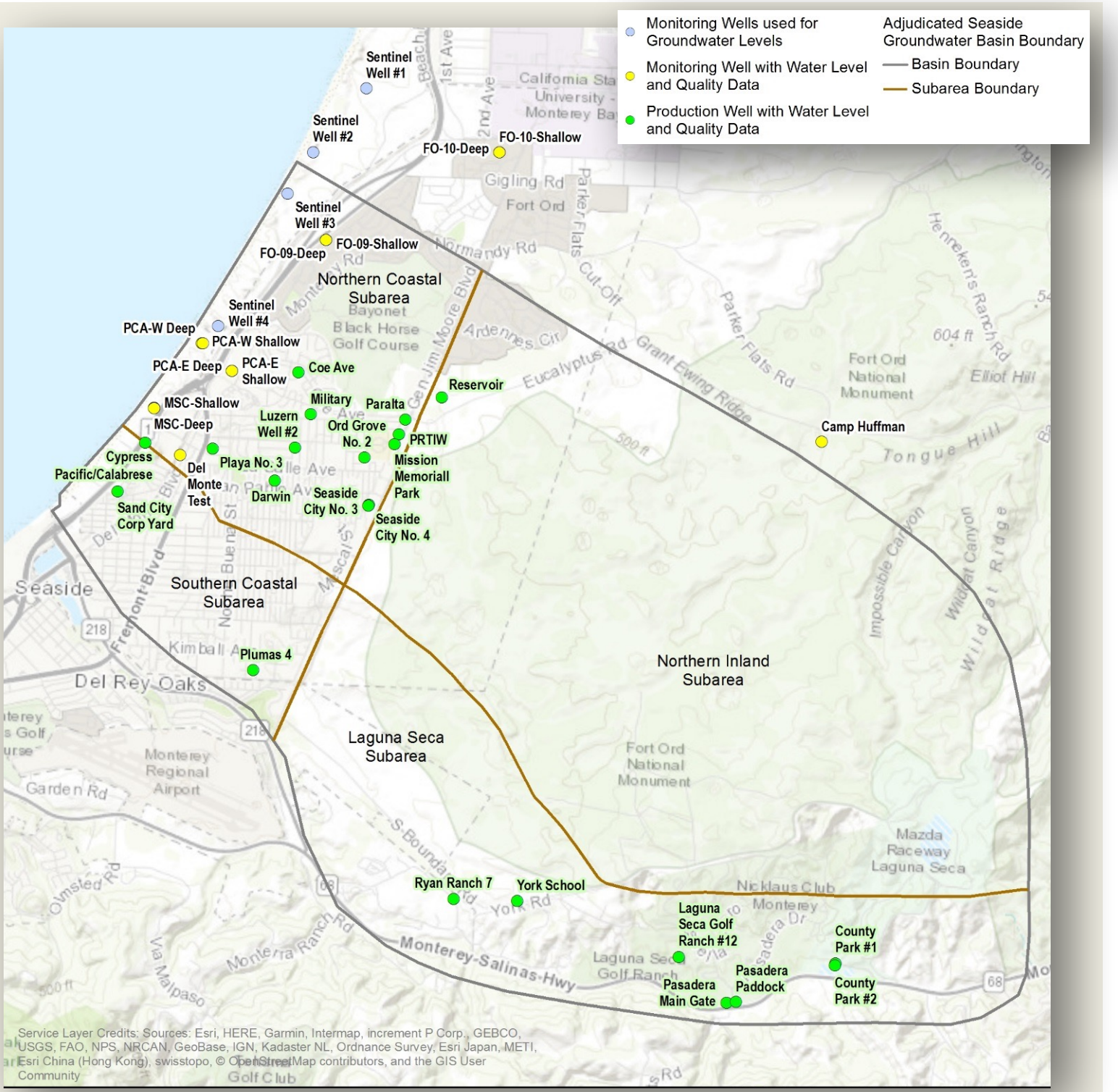
MONTGOMERY & ASSOCIATES

Presented to the Seaside Basin Technical Advisory Committee

November 21, 2018

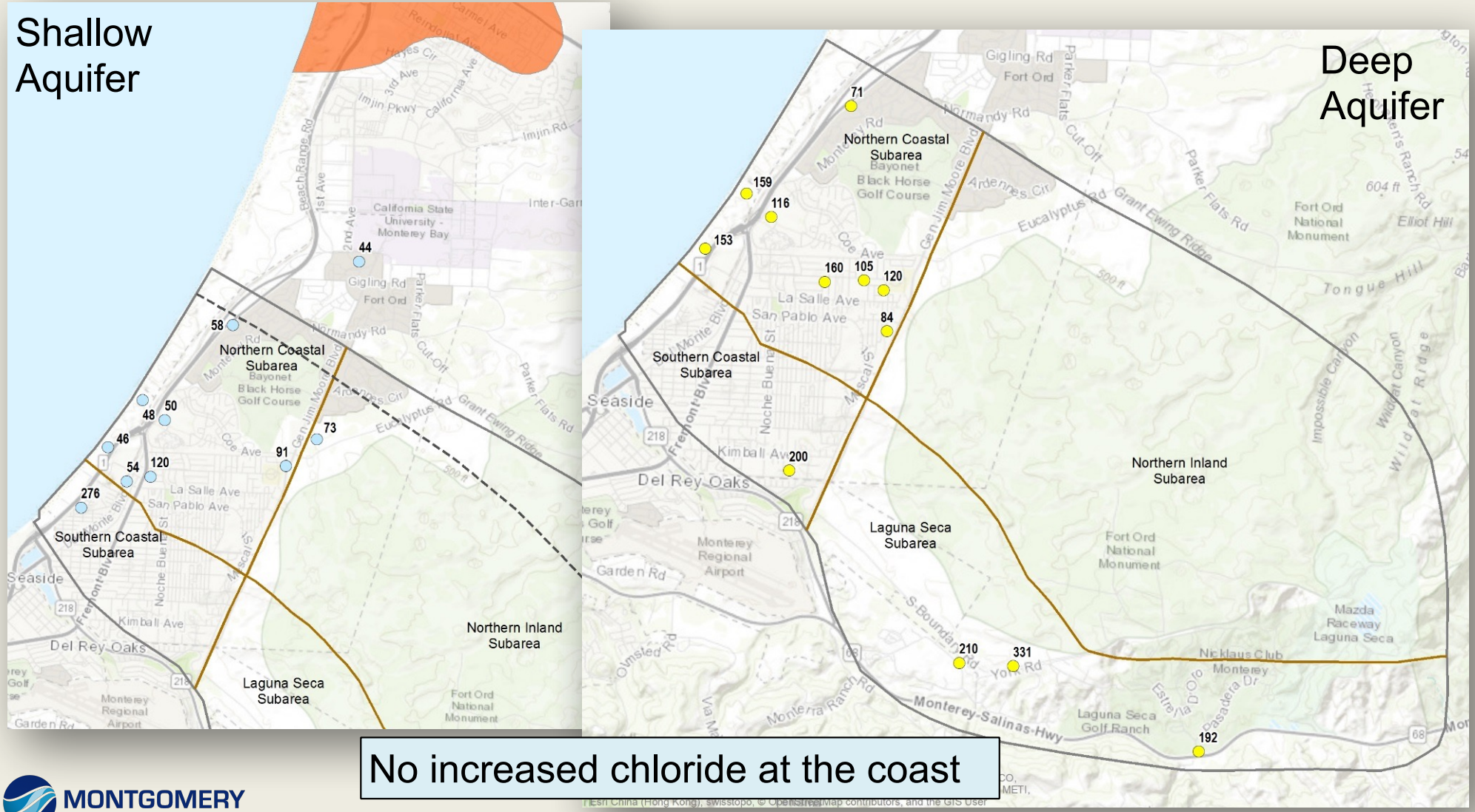
SIAR ANALYSIS

- Chloride Distribution and Na/Cl Molar Ratio
- Cation/Anions – Piper and Stiff Diagrams
- Electric Induction Logs
- Groundwater Elevations
- Protective Groundwater Elevations
- Groundwater Production



WELL DATA INCLUDED IN SIAR

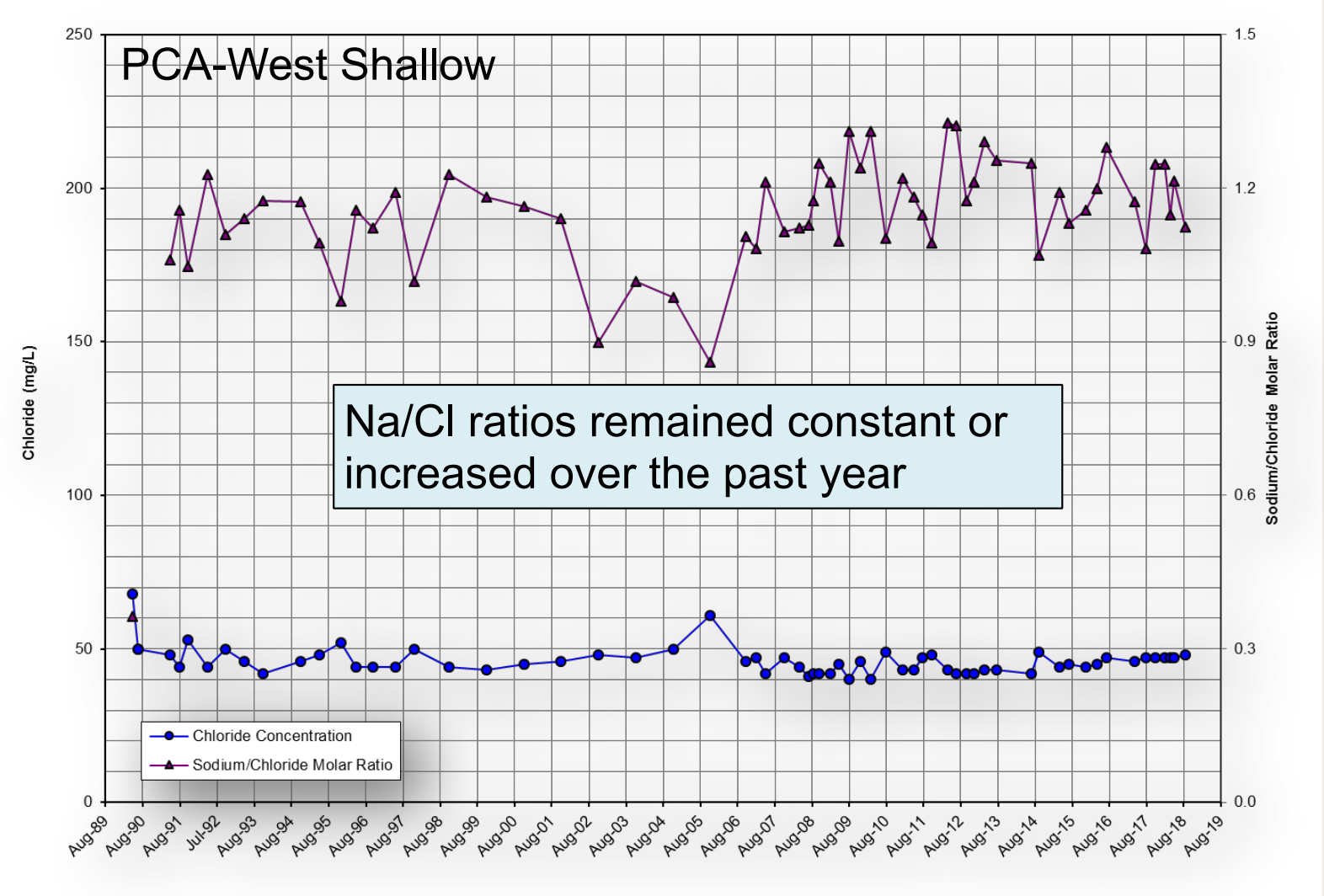
CHLORIDE DISTRIBUTION



No increased chloride at the coast

MONTGOMERY & ASSOCIATES

SODIUM/CHLORIDE MOLAR RATIO



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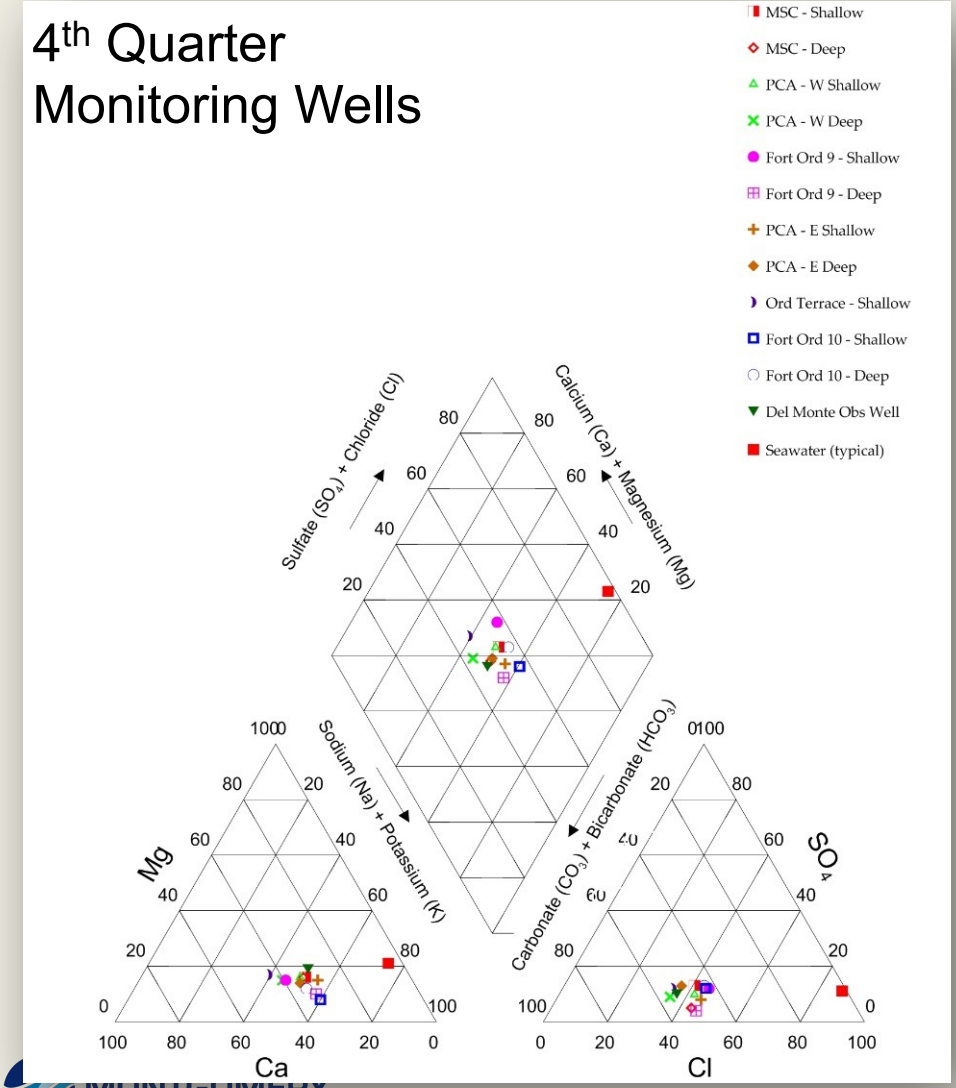
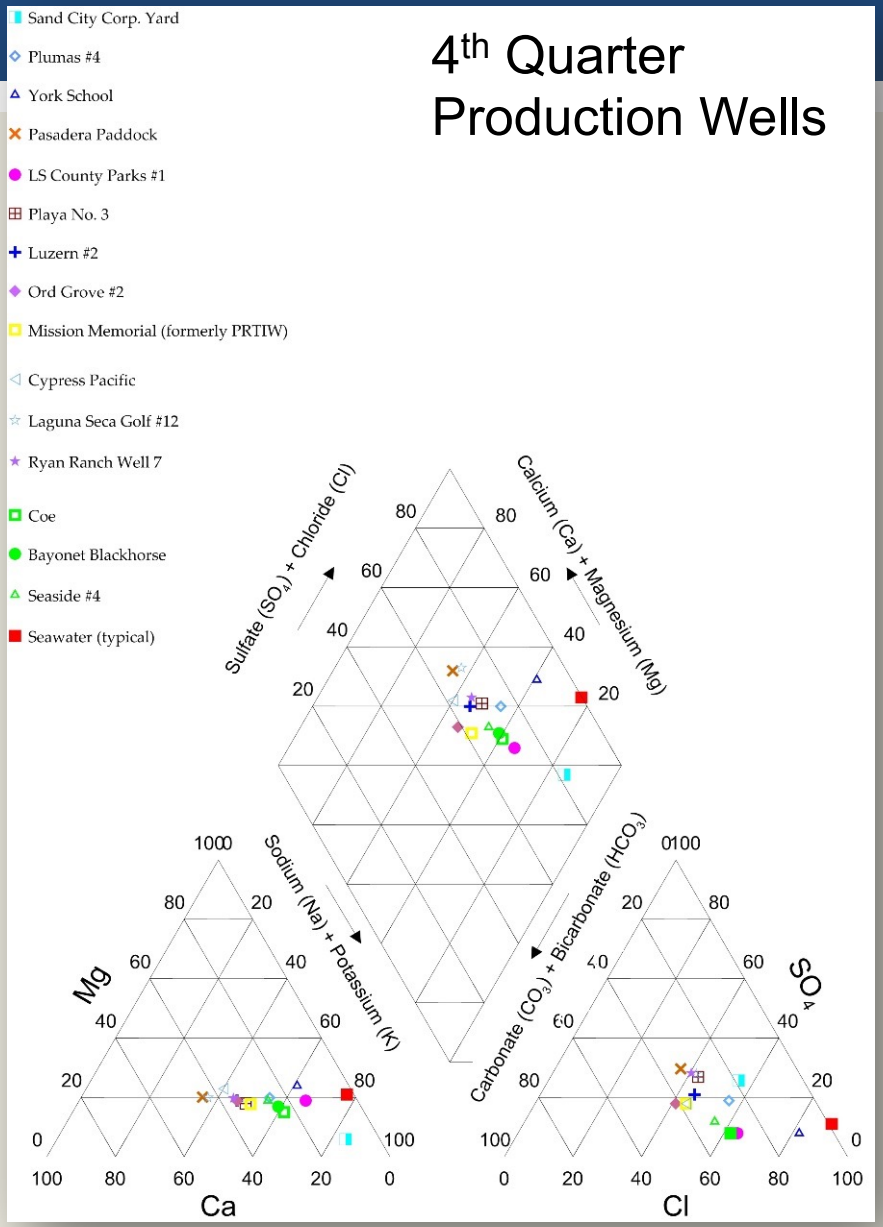
PIPER DIAGRAMS

No trends towards seawater

4th Quarter Monitoring Wells



4th Quarter Production Wells



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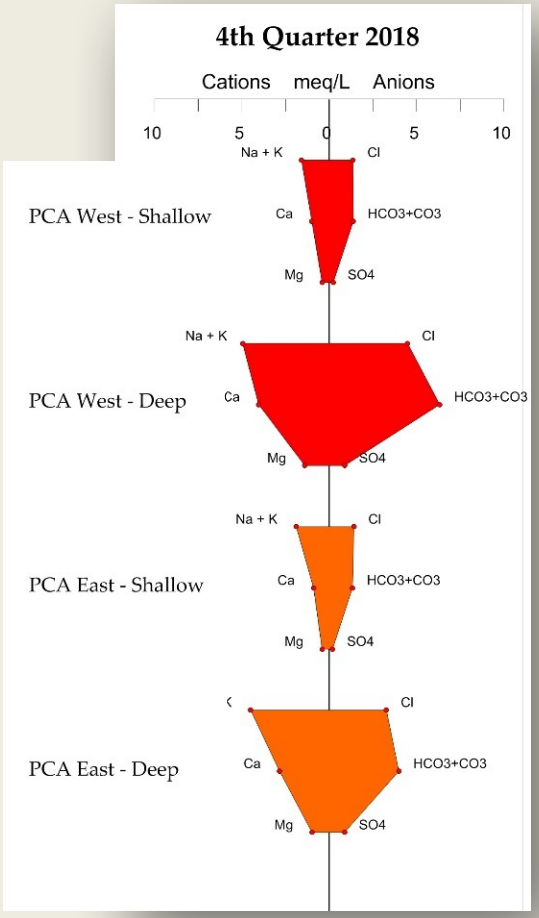
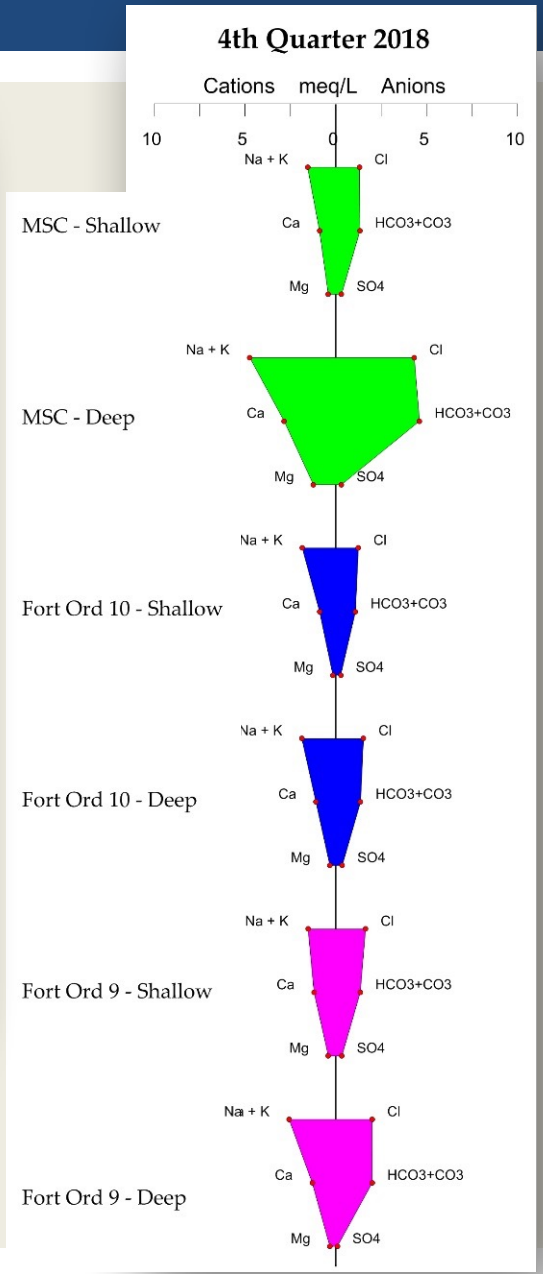
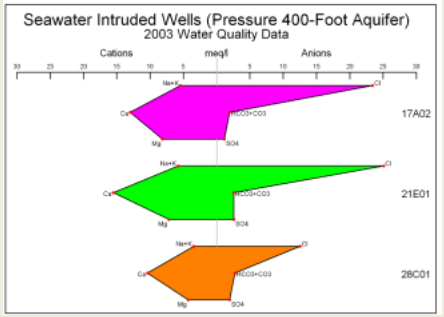
MONITORING WELL STIFF DIAGRAMS





No shapes typical of seawater intruded anions & cations



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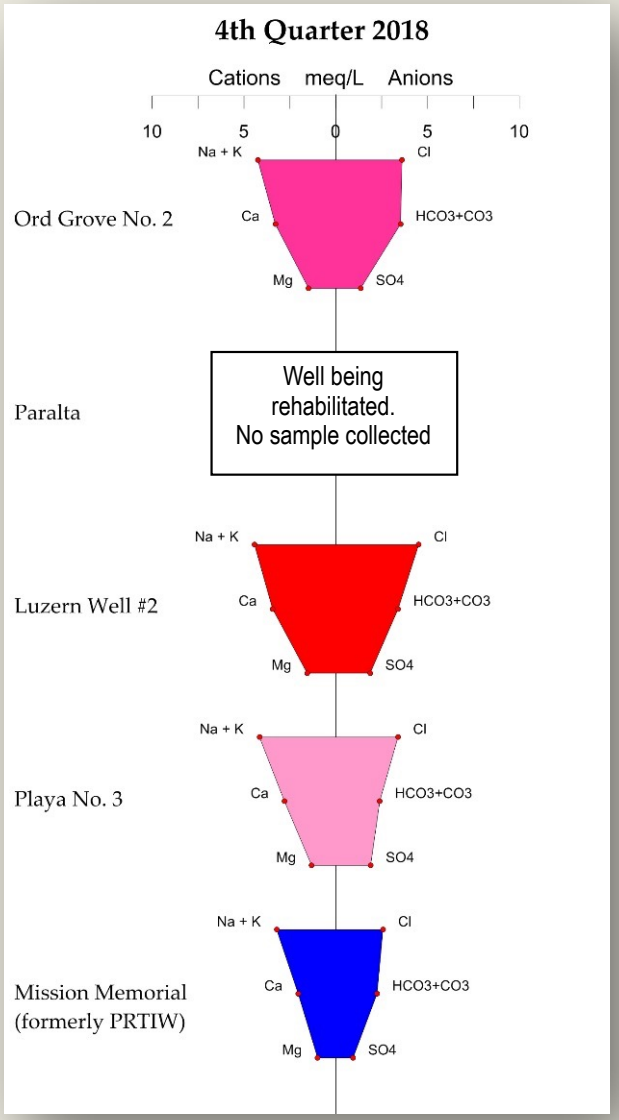
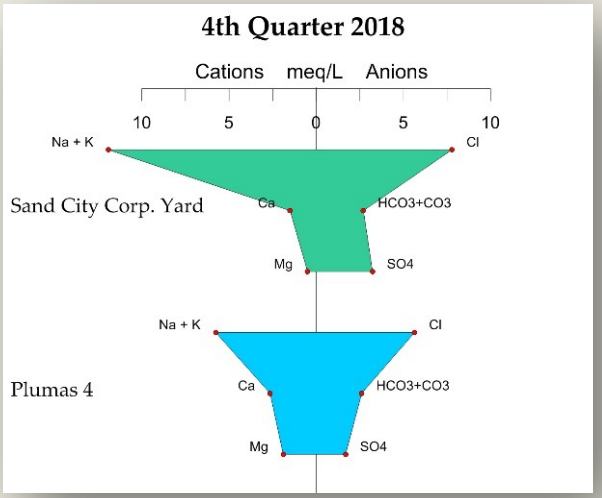
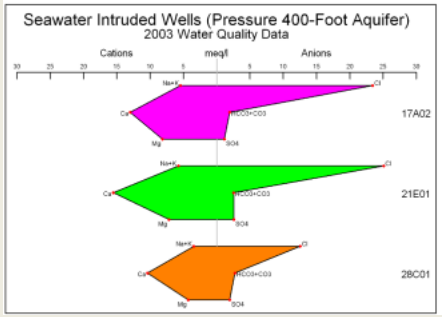
PRODUCTION WELL STIFF DIAGRAMS





No shapes typical of seawater intruded anions & cations



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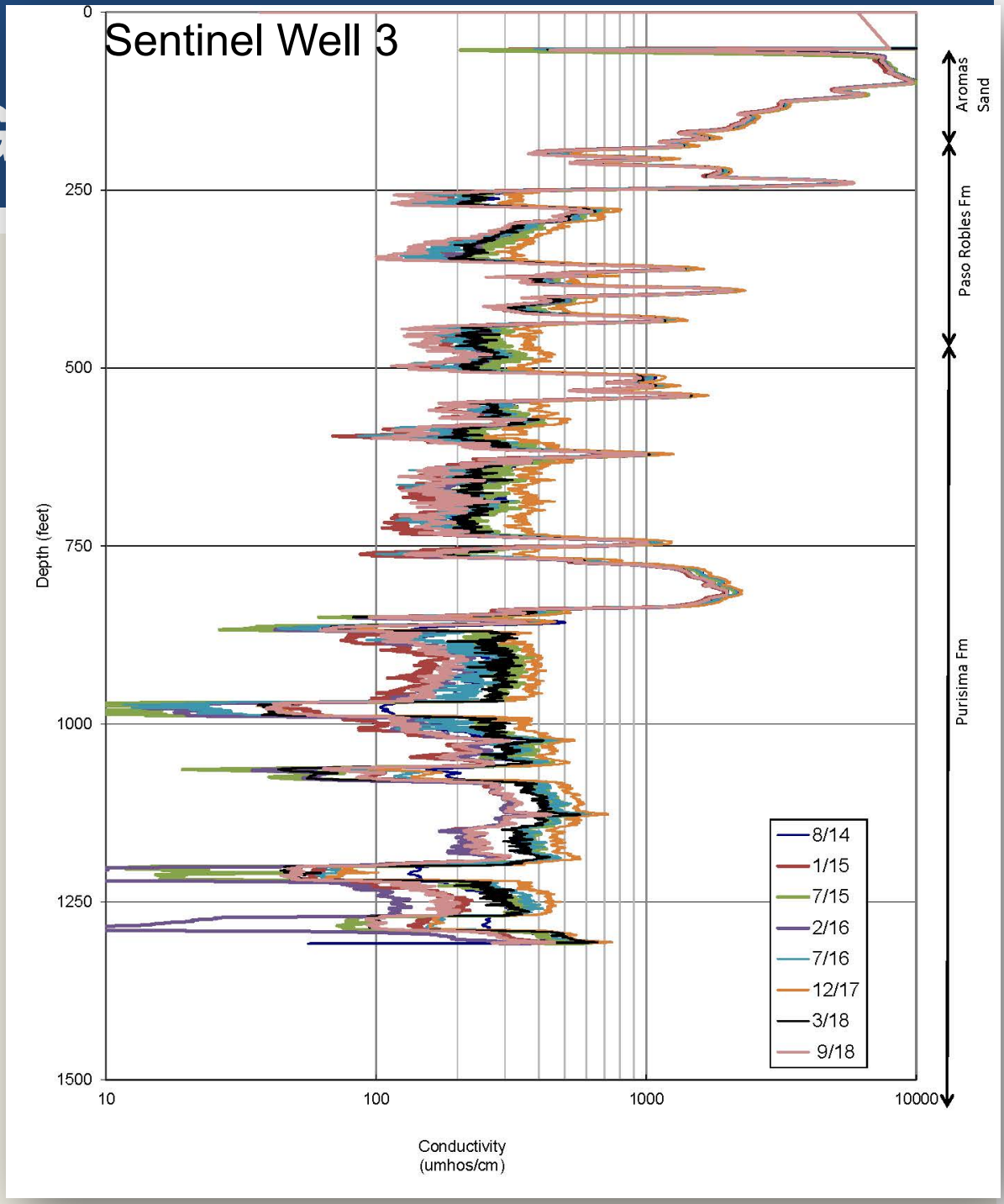
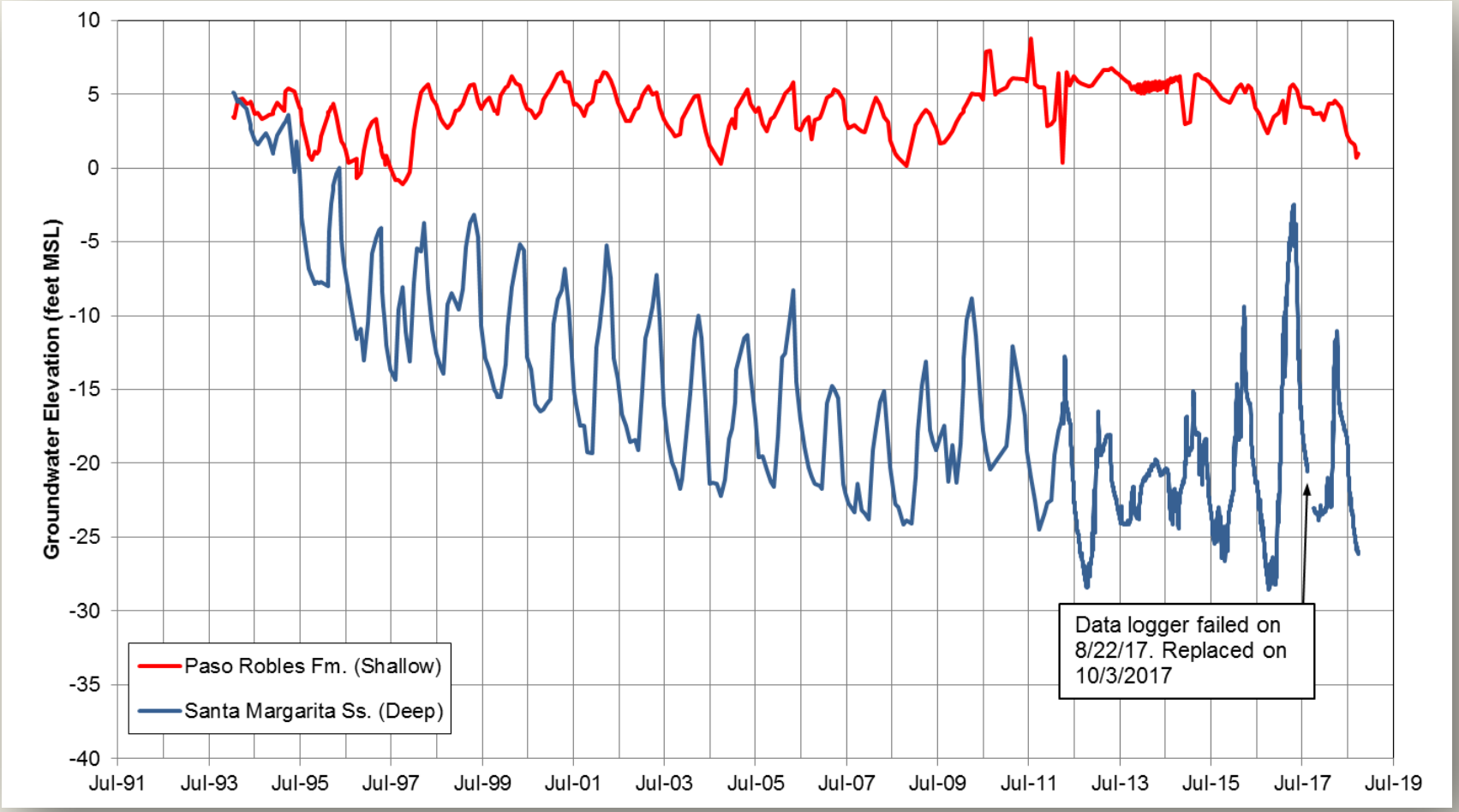
ELECTRIC INDUCTION LOG



None of the Sentinel wells show detectable changes in conductivity in the deeper aquifers where production wells extract groundwater

MONTGOMERY & ASSOCIATES

NORTHERN COASTAL GROUNDWATER ELEVATIONS



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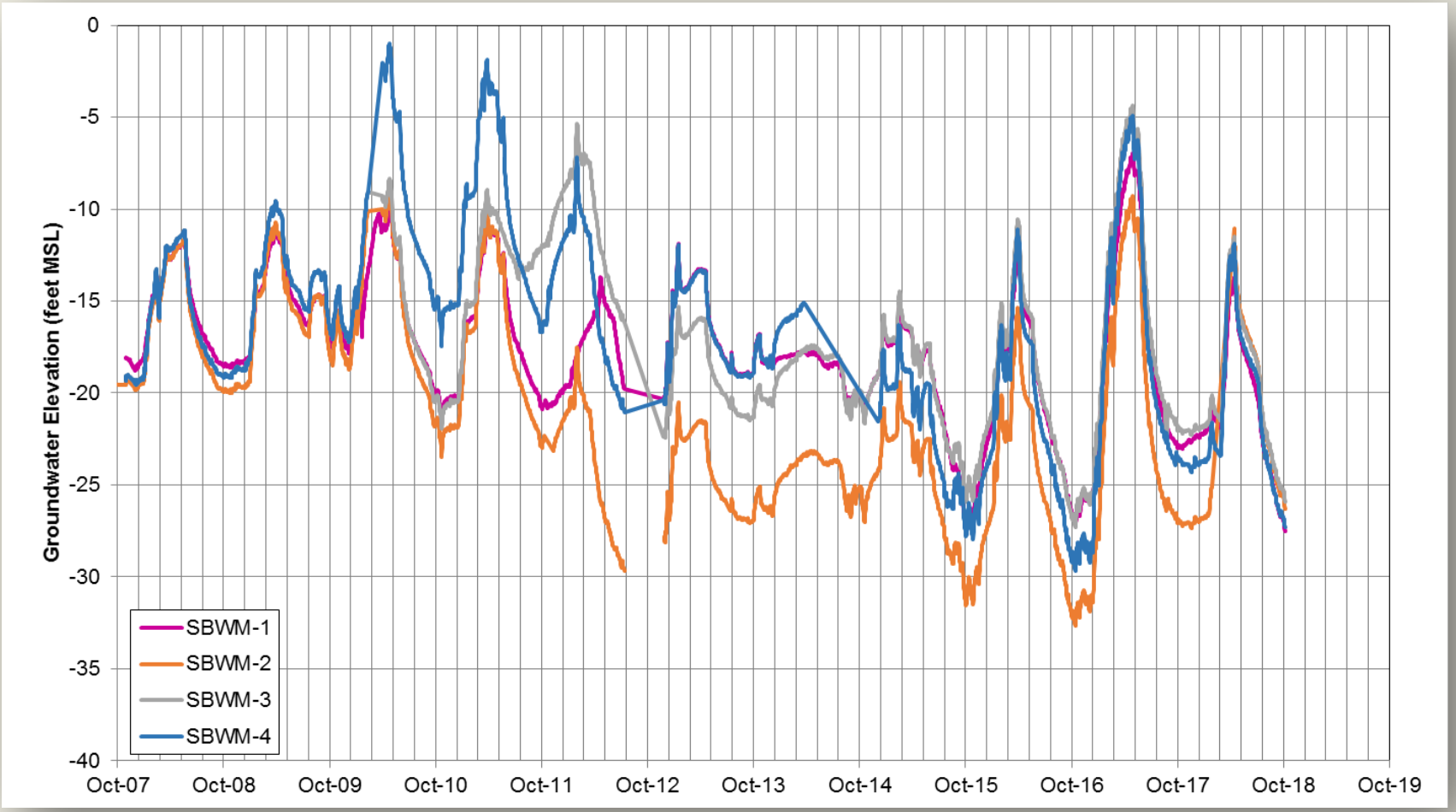
NORTHERN COASTAL GROUNDWATER ELEVATIONS



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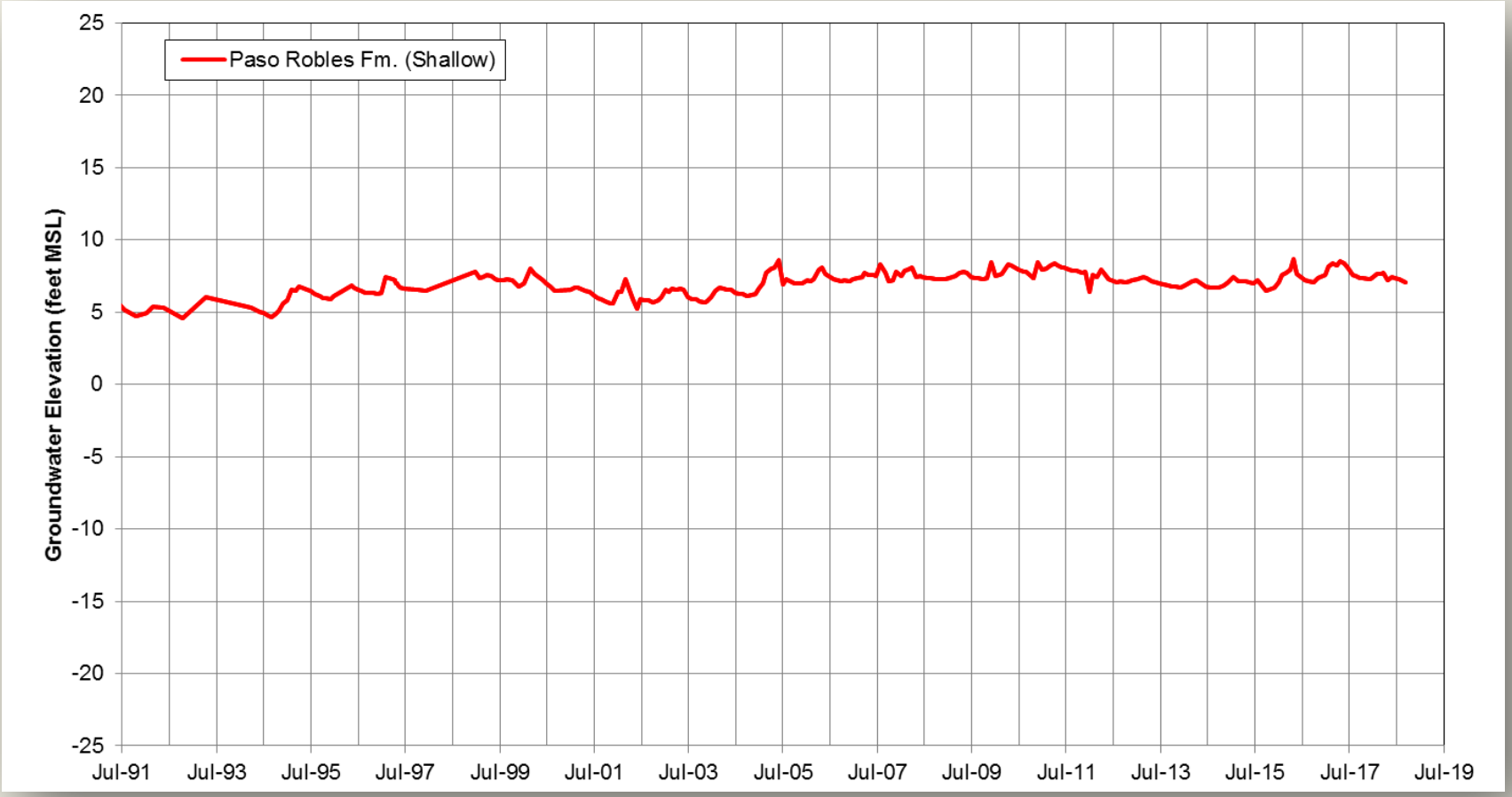
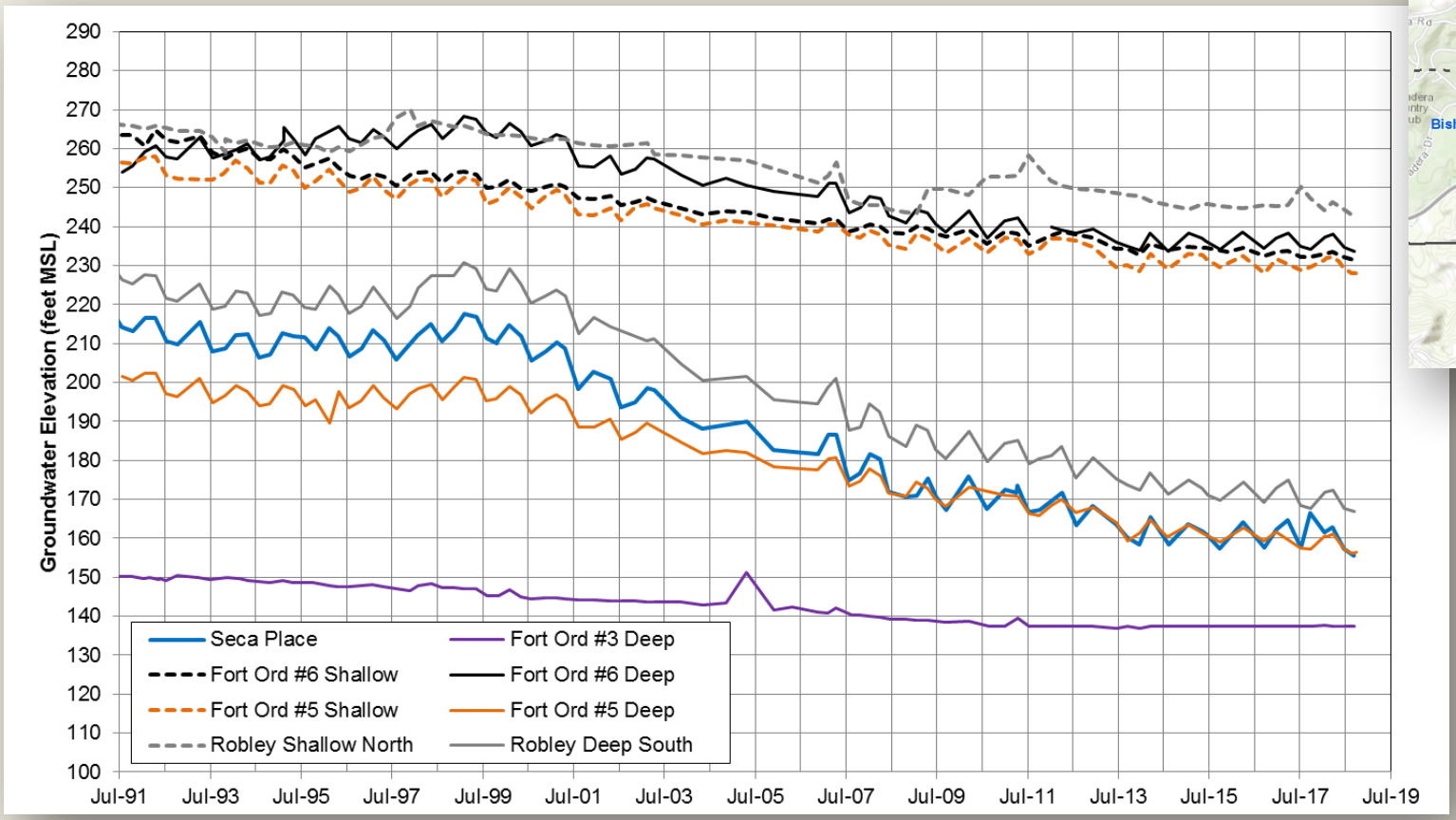
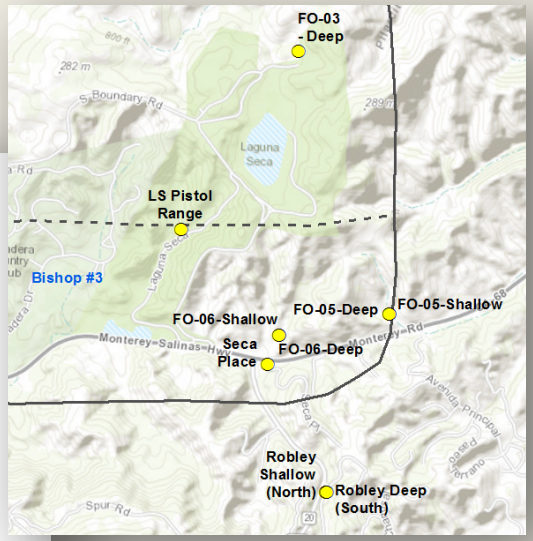
SOUTHERN COASTAL GROUNDWATER ELEVATIONS



MONTGOMERY & ASSOCIATES

EASTERN LAGUNA SECA GROUNDWATER ELEVATIONS





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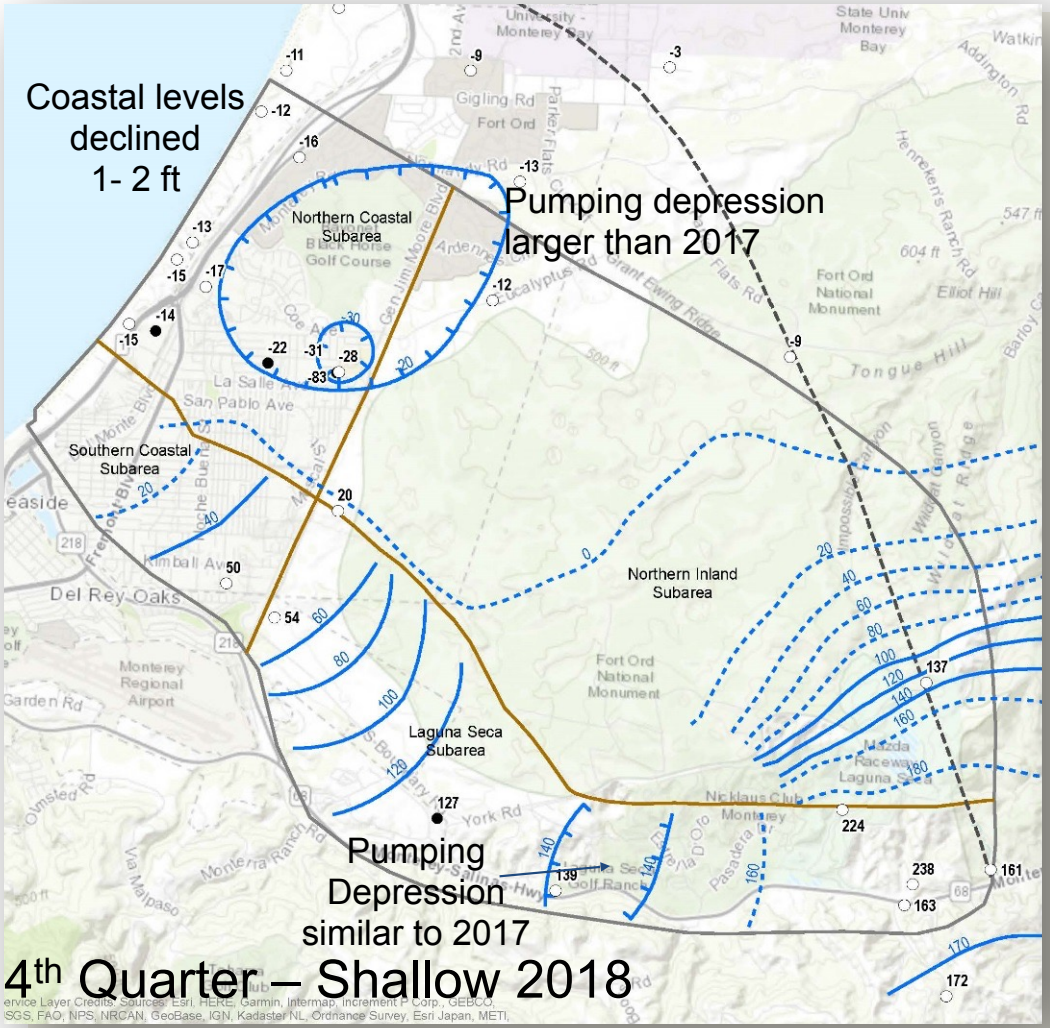
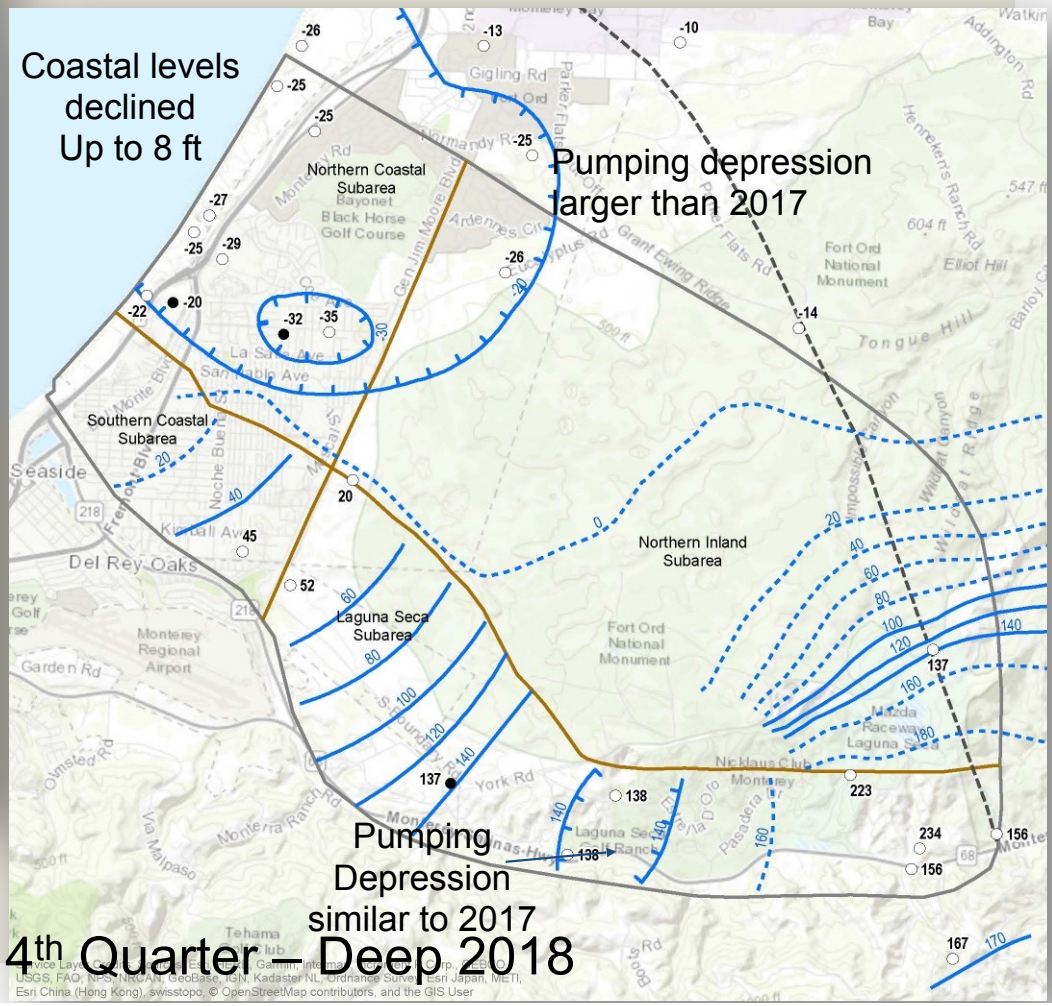
GROUNDWATER ELEVATION CONTOURS





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PROTECTIVE GROUNDWATER ELEVATIONS

Subarea	Well	Depth	Protective Elevation.	Above or Below
Northern Coastal	*MSC*	*Deep*	*17*	*Below*
		Shallow	11	Below
	PCA-W	*Deep*	*17*	*Below*
		Shallow	2	Below
	Sentinel 3	*Deep*	*4*	*Below*
Southern	CDM-MW4	Shallow	2	Above

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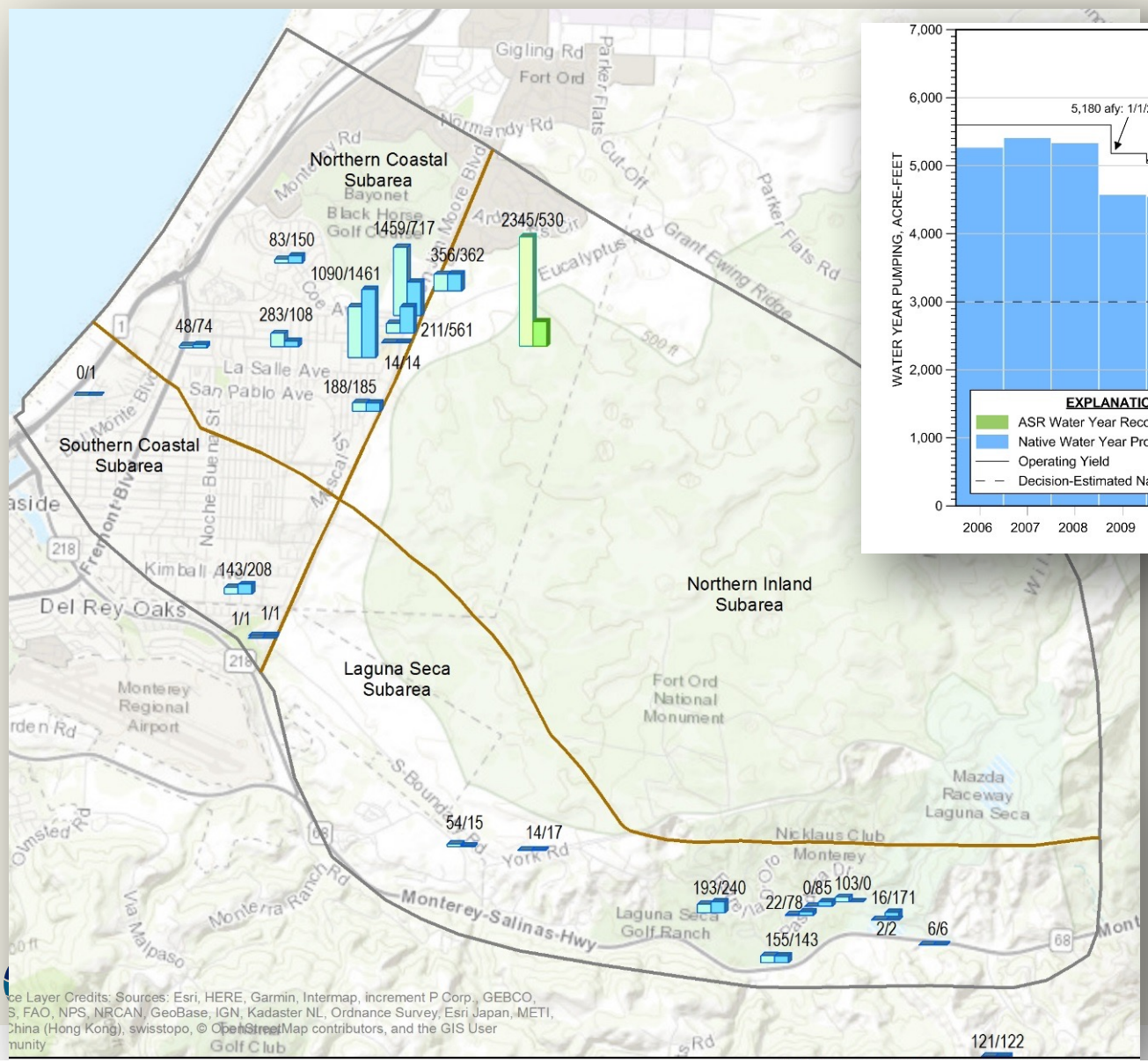
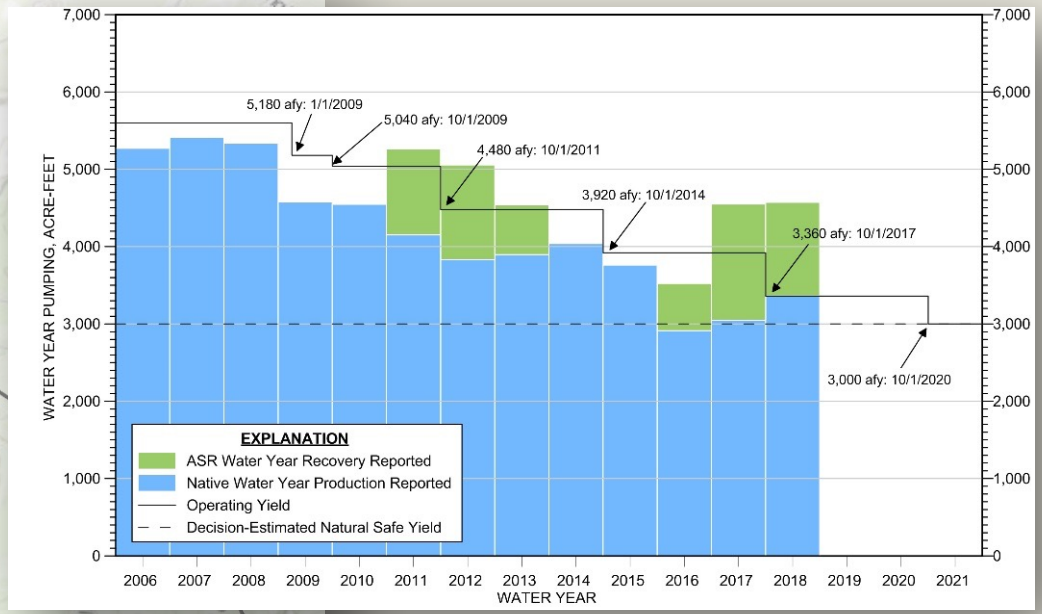
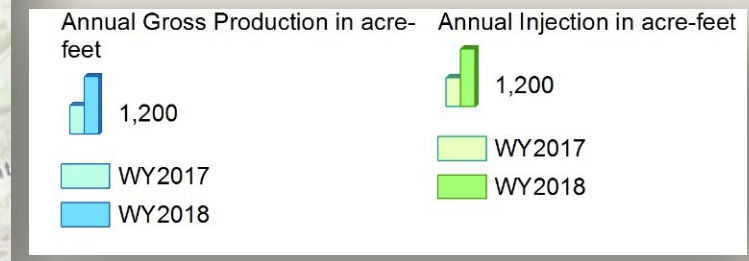
GROUNDWATER PRODUCTION WY 2017 VS 2018







CONCLUSIONS

Analyses indicating seawater intrusion is NOT occurring:

- No groundwater chemistry changes towards seawater in either shallow or deep groundwater
- Overall, chloride concentration trends were stable for most monitoring wells, with no increases greater than 10 mg/L
- Sodium/chloride molar ratios in the monitoring wells remained constant or increased over the past year
- Induction logging data at the coastal Sentinel Wells do not show large changes over time that are indicative of seawater intrusion

CONCLUSIONS

Conditions in the basin that continue to provide a potential for seawater intrusion:

- **All deep groundwater in the Northern Coastal subarea is below sea level**
  - **2nd quarter (winter/spring) > 12 feet below sea level**
  - **4th quarter (summer/fall) > 25 feet below sea level**
- **Groundwater levels remain below protective elevations in all deep target monitoring wells**
- **Currently, only one of the three shallow wells' groundwater levels are above protective elevations**

CONCLUSIONS

- After 16 years of ongoing declines in the Laguna Seca Subarea, the rate of decline is now less and appears close to stabilizing
- Native groundwater production in the Seaside Groundwater Basin for Water Year 2018 was 3,363.4 acre-feet:
  - 314 acre-feet more than Water Year 2017
  - 3.4 acre-feet more than the Decision-ordered Operating Yield of 3,360 acre-feet per year that is required between October 1, 2017 and September 30, 2020

RECOMMENDATIONS

1. Continue to Analyze and Report on Water Quality Annually

2. Include Data from New Monitoring Wells Installed as Part of Recharge Projects

MONTGOMERY & ASSOCIATES

QUESTIONS?

MONTGOMERY
& ASSOCIATES

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	6
AGENDA TITLE:	Discuss and Provide Input on the Preliminary Draft Watermaster 2018 Annual Report
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

The Watermaster submits an Annual Report to the Court after the end of each Water Year to fulfill one of its obligations under the Court Decision that created the Watermaster.

A Preliminary Draft Annual Report for 2018 is being presented to the TAC for its review and input, in as complete a form as it can be as of today's TAC meeting. Due to its large file size, a complete copy of the Preliminary Draft 2018 Annual Report cannot be included with the agenda packet. However, a copy of the body of the Preliminary Draft is attached. A copy of the complete Preliminary Draft Annual Report was posted on the Watermaster's website for anyone that would like to examine the entire document.

At today's meeting I will review with the TAC the principle components of the Preliminary Draft and provide an opportunity for the TAC to raise questions, provide input, and provide suggested edits to the document. The items highlighted in yellow will be revised or completed as soon as the data has been prepared , or after the Board's January meeting.

ATTACHMENTS:	Preliminary Draft 2018 Annual Report (Body only)
RECOMMENDED ACTION:	Provide input to the Technical Program Manager regarding any edits to the Preliminary Draft Annual Report that the TAC wishes to propose

SEASIDE BASIN WATERMASTER

ANNUAL REPORT – 2018

Integral to the Superior Court Decision (Decision) rendered by Judge Roger D. Randall on March 27, 2006 is the requirement to file an Annual Report. This 2018 Annual Report is being filed on or before January 15, 2019, consistent with the provisions of the Decision, as amended by the Order Amending Judgement filed March 29, 2018.

This Annual Report addresses the specific Watermaster functions set forth in Section III. L. 3. x. of the Decision. In addition this Annual Report includes sections pertaining to:

- Water quality monitoring and Basin management
- Information that the Watermaster would otherwise include within a Case Status Conference Statement, including:
    - A summary of basin conditions and important developments concerning the management of the Basin
    - Planned near- and long-term actions of the Watermaster
    - Information concerning the status of regional water supply issues
    - Management activities that may bear on the Basin's wellbeing.

A. Groundwater Extractions

The schedule summarizing the Water Year 2018 (WY 2018) groundwater production from all the producers allocated a Production Allocation in the Seaside Groundwater Basin is provided in Attachment 1, "Seaside Groundwater Basin Watermaster, Reported Quarterly and Annual Water Production from the Seaside Groundwater Basin for all Producers Included in the Seaside Basin Adjudication During Water Year 2018." For the purposes of this Annual Report Water Year 2018 is defined as beginning October 1, 2017 and ending on September 30, 2018. NOTE: REVISED PRODUCTION DATA IS BEING SUBMITTED BY SOME PRODUCERS, SO THE PRODUCTION REPORT CONTAINED IN ATTACHEMENT 1 WILL BE REVISED WHEN THAT DATA IS RECEIVED.

B. Groundwater Storage

Monterey Peninsula Water Management District (MPWMD), in cooperation with California American Water (CAW), operates the Seaside Basin Aquifer Storage and Recovery (ASR) program. Under the ASR program, CAW diverts water from its Carmel River sources during periods of flow in excess of NOAA-Fisheries' bypass flow requirements, and transports the water through the existing CAW distribution system for injection and storage in the Seaside Basin at the MPWMD's Santa Margarita ASR site and CAW's Seaside Middle School ASR site. During WY 2018, 530 AF was diverted and stored in the Seaside Basin under the ASR program. Rainfall in the area was about 64% of normal, Carmel River flow was 67% of normal. WY 2018 was classified as "Below Normal" by MPWMD.

Based upon production reported for WY 2018, the following Standard Producers are entitled to Free and Not-Free Carryover Credits to 2018 in accordance with the Decision, Section III. H. 5:

Producer	Free Carryover Credit (Acre-feet)	Not-Free Carryover Credit (Acre-feet)
Granite Rock	180.68	86.31
DBO Development	341.51	166.05
Calabrese (Cypress)	14.36	1.81
CAW	182.91	316.56
City of Seaside Muni	00.00	00.00

NOTE: REVISED PRODUCTION DATA IS BEING SUBMITTED BY SOME PRODUCERS, SO THE CARRYOVER CREDITS SHOWN ABOVE MAY NEED TO BE REVISED WHEN THAT DATA IS RECEIVED.

C. Amount of Artificial Replenishment, If Any, Performed by Watermaster
Per the Decision, "Artificial Replenishment" means the act of the Watermaster, directly or indirectly, engaging in contracting for Non-Native Water to be added to the Groundwater supply of the Seaside Basin through Spreading or Direct Injection to offset the cumulative Over-Production from the Seaside Basin in any particular Water Year pursuant to Section III.L.3.j.iii. It also includes programs in which Producers agree to refrain, in whole or in part, from exercising their right to produce their full Production Allocation where the intent is to cause the replenishment of the Seaside Basin through forbearance in lieu of the injection or spreading of Non-Native Water (referred to herein as "In-lieu Replenishment").

During Water Year 2018 the Watermaster did not indirectly engage in In-lieu Replenishment of the Basin. No non-native water was made available to the Basin during Water Year 2018 under the Memorandum of Understanding and Agreement entered into by Watermaster with the City of Seaside for its golf course irrigation program creating in-lieu replenishment water.

D. Leases or Sales of Production Allocation and Administrative Actions
In WY2018 there were no transfers or assignments of water allocations.

A Status Conference with the Court was held on March 23, 2018. The transcript of the Status Conference Hearing is available for viewing on the Watermaster web site at http://www.seasidebasinwatermaster.org/ under Postings and Records on the March 17, 2017 date line in the Court Docs column.

During WY 2018 the Watermaster Board did not make any revisions to its *Rules and Regulations*. However, the mailing address for the Watermaster changed to: Seaside Basin Watermaster, P.O. Box 51502, Pacific Grove, CA 93950.

During WY 2018 the Watermaster Board was comprised of the following Members and Alternates:

MEMBER	ALTERNATE	REPRESENTING
Director Paul Bruno	N/A	Coastal Subarea Landowner
Eric Sabolsice/Christopher Cook	Nina Miller	California American Water
Director Bob Costa	N/A	Laguna Seca Subarea Landowner
Director Jeanne Byrne	Andrew Clarke	MPWMD
Mayor Mary Ann Carbone	Todd Bodem	City of Sand City
Supervisor Mary Adams	Jane Parker	Monterey County (MCWRA)

Mayor Jerry Edelen	Kristin Clark	City of Del Rey Oaks
Councilmember Dan Albert	Mayor Clyde Roberson	City of Monterey
Mayor Ralph Rubio	Dennis Alexander	City of Seaside

E. Use of Imported, Reclaimed, or Desalinated Water as a Source of Water for Storage or as a Water Supply for Lands Overlying the Seaside Basin

The CAW/MPWMD ASR Program operated in WY 2018 and accordingly 530 acre-feet of water was injected into the Basin as Stored Water Credits and 1,320 acre-feet was extracted.

A Storage and Recovery Agreement between Watermaster, California American Water Company, and MPWMD governing the future injection and recovery of water from the Pure Water Monterey Project, was developed and executed in WY 2018. This Agreement formalizes the terms and conditions of that storage and recovery program. A copy of this Agreement is contained in Attachment 13. THIS AGREEMENT WAS STILL BEING DEVELOPED WHEN THIS PRELIMINARY DRAFT WAS PREPARED.

F. Violations of the Decision and Any Corrective Actions Taken

Section III. D. of the Decision enjoins all Producers from any Over-Production beyond the Operating Yield in any Water Year in which the Watermaster declares that Artificial Replenishment is not available or possible. Section III. L. 3. j. iii. requires that the Watermaster declare the unavailability of Artificial Replenishment in December of each year, so that the Producers are informed of the prohibition against pumping in excess of the Operating Yield.

The Watermaster made a declaration regarding the availability of Artificial Replenishment for WY 2019 at its Board meeting of December 5, 2018. A copy of this declaration is contained in Attachment 2. In WY 2018 the Watermaster implemented another 10% water production reduction required under Section III.B.2 of the Decision. No additional water production reductions were implemented in WY 2018.

Total pumping for WY 2018 exceeded the Operating Yield (OY) of the Basin by 3.4 acre-feet, and exceeded the Natural Safe Yield (NSY) of the Basin by 363.4 acre-feet.

California American Water reported annual pumping quantities that exceeded their Standard Production NSY allocation by 374.80 acre-feet, and reported annual pumping quantities that did not exceed their Operating Yield allocation. The Watermaster will assess California American Water a Replenishment Assessment for this over production, as further described in Section H, below.

The City of Seaside reported annual pumping quantities that exceeded their Standard Production NSY allocation by 32.46 acre-feet, and reported annual pumping quantities that exceeded their Operating Yield allocation by 33.89 acre-feet. The City of Seaside did not exceed its Alternative Production NSY. The Watermaster will assess the City of Seaside a Replenishment Assessment for these over productions, as further described in Section H, below.

G. Watermaster Administrative Costs

The total estimated Administrative costs through the end of Fiscal Year 2018 amounted

to $80,000 including an $18,000 dedicated reserve. Costs include the Administrative Officer salary and legal counsel fees. The "Fiscal Year 2018 Administrative Fund Report" and "Fiscal Year 2018 Operations Fund Report" are provided as Attachment 3.

H. Replenishment Assessments

At its meeting of October 3, 2018 the Watermaster Board determined that the Replenishment Assessment unit cost of $2,872 per acre-foot, which is the unit cost that was used in WY 2017, should remain the same for WY 2018.

Alternative and Standard Producers report their production amounts from the Basin to the Watermaster on a quarterly basis. Based upon the reported production for WY 2018, California American Water's Replenishment Assessment for Overproduction in excess of its share of the Natural Safe Yield is $1,076,421.49, and no overproduction in excess of its share of the Operating Yield. NOTE: REVISED PRODUCTION DATA IS BEING SUBMITTED BY CALIFORNIA AMERICAN WATER, SO THE REPLENISHMENT ASSESSMENT CONTAINED IN ATTACHEMENT 5 MAY NEED TO BE REVISED WHEN THAT DATA IS RECEIVED.

The City of Seaside's Replenishment Assessment for its Municipal System for Overproduction in excess of its share of the Natural Safe Yield is $93,212.10, and for overproduction in excess of its share of the Operating Yield is $24,329.92. The City of Seaside did not exceed its Alternative Production Allocation for its Golf Course System production. A summary of the calculations for Replenishment Assessments for WY 2018 is contained in Attachment 5.

I. All Components of the Watermaster Budget

The Watermaster budget has four separate funds: Administrative Fund; Monitoring & Management–Operations; Monitoring and Management–Capital Fund and; Replenishment Fund. Copies of the budgets for Fiscal Year 2018 are contained in Attachment 6.

The Watermaster Board is provided monthly financial status reports on all financial activities for each month with year-to-date totals.

J. Water Quality Monitoring and Basin Management

Change in Watermaster's Primary Hydrogeological Consultant

Much of the Watermaster's work is performed through contracts with hydrogeological consultants. The primary hydrogeological consultant the Watermaster has used for many years, HydroMetrics LLC, was purchased in July 2018 by the hydrogeological consulting firm of Errol L. Montgomery & Associates (Montgomery & Associates) of Tucson, Arizona.

Mr. Derrik Williams, President of the former HydroMetrics LLC, explained that he had known and worked with many of the principles of Montgomery & Associates for over 30 years, and that they are a groundwater focused company. He reported that he found Montgomery & Associates to have a highly qualified staff who have the same technical expertise and commitment to both clients and employees as HydroMetrics LLC.

In order to ensure that the Watermaster would continue to receive the same level and quality of services it had been receiving from HydroMetrics LLC, prior to the purchase there was agreement between the Watermaster, HydroMetrics LLC, and Montgomery & Associates on the following issues:

- All of HydroMetrics LLC staff members would become employees of Montgomery & Associates. The former HydroMetrics LLC firm would continue to exist essentially unchanged in terms of size, staff members, fees, capabilities, etc.
- Montgomery and Associates will occupy HydroMetrics LLC's former Oakland office and will have the same personnel locally and the same financial structure. However, the staff there will be supported by a much larger group of hydrogeologists, modelers, and graphic artists who can be more responsive to the Watermaster's questions.
- Derrik Williams (President of HydroMetrics) and Georgina King (a Senior Hydrogeologist at HydroMetrics), both of whom have performed and/or directed all of the work previously performed for the Watermaster, would continue to be the staff with whom the Watermaster would normally interact.

Based on these explanations and assurances, the Watermaster's Technical Advisory Committee and Board of Directors were comfortable with the change in ownership. Effective July 1, 2018, work assignments that would normally have been made to HydroMetrics LLC are being made to Montgomery & Associates.

Water Quality Analytical Results

Groundwater quality data continued to be collected and analyzed on a quarterly basis during WY 2018 from the enhanced network of monitoring wells. The low-flow sampling method implemented in 2009 continued to be used in 2018 and is expected to continue to be used in the future to improve the efficiency of sample collection. As discussed in the 2013 Annual Report, the Watermaster reduced the frequency of water quality sampling at SBWM-MW5 to once every 3 years.

No modifications to the quarterly data collection frequency from the enhanced network of monitoring wells were made during WY 2018.

Up until WY 2010 quarterly geophysical (induction) logging was performed at the four coastal Watermaster Sentinel wells that were installed in 2007. The induction logging results showed very little variations and trends were steady since that monitoring began, indicating that the coastal water quality conditions were not changing at this sample frequency. Therefore, beginning in WY 2010 the Court approved reducing the induction logging frequency to semi-annually at these wells.

The expanded water quality analyses begun in WY 2012 were continued in WY 2018. However, as discussed and recommended in the 2017 Annual Report (refer to Attachments 8 and 13 of the 2017 Annual Report), in WY 2018 water quality sampling was discontinued in the Watermaster's Sentinel Wells located along the coast (wells SBWM-1, SBWM-2, SBWM-3, and SBWM-4), because those water quality samples were found to not be representative of the water quality in the aquifers in which these wells were completed. Water quality sampling was continued for the 3 most coastal MPWMD monitoring wells (MSC, PCA, and FO-09).

Copies of the sampling results are contained in the report in Attachment 7.

Monitoring and Management Program Work Plan for the Upcoming Year

The 2019 Monitoring and Management Program (M&MP) Work Plan contained in Attachment 9 includes the types of basin management activities conducted in prior years as well as revisions approved by the Board at its October 3, 2018 meeting.

Other than small changes due to changes in hourly rates for some of the consultants, the following are the principle differences between the 2018 M&MP and the proposed 2019 M&MP, and their respective budgets:

Task I.2.b.3 (Collect Quarterly Water Quality Samples): In 2018 the total amount budgeted for this Task was $51,128. That cost included collecting and analyzing water quality samples from the Watermaster's Sentinel Wells. In early 2018 it was determined that water quality samples that have historically been collected from the Sentinel Wells were not representative of the quality of the water in the aquifers. Therefore, the decision was made to discontinue collecting and analyzing samples from these wells. This led to the reduction in cost for this Task to $42,083 in 2019.

Task I.3.a.1 (Update the Existing Model): $54,370 was included in the 2018 budget for this Task to have HydroMetrics update the existing groundwater model of the Seaside Basin. That work was completed in 2018 and therefore does not need to be included in the M&MP budget for 2019. This led to the reduction in cost for this Task to $0 in 2019.

Task I.3.c (Refine and/or Update the Basin Management Action Plan): $45,260 was included in the 2018 budget for this Task to have HydroMetrics update the existing Basin Management Action Plan. That work has been completed and therefore does not need to be included in the M&MP budget for 2019. This led to the reduction in cost for this Task to $0 in 2019.

Task I.3.e (Seaside Basin Geochemical Model): This was a new Task for 2018, and the amount for this Task in the 2018 budget was $50,000. The Task is being performed by MPWMD's Consultant, Pueblo Water Resources, Inc., and is expected to be completed in late 2018 or early 2019. However, HydroMetrics (now Montgomery & Associates) may need to work on this task if the initial modeling results find that there could be adverse water quality impacts in the aquifers due to the introduction of water from the Monterey Peninsula Water Supply Project (desalinated water), the Pure Water Monterey Project (advance treated wastewater) and/or Aquifer Storage and Recovery Water (Carmel Basin water). If the modeling results in this finding, Montgomery & Associates may need to use the Seaside Basin groundwater model to help Pueblo Water Resources develop means/measures to mitigate such impacts. A $10,000 amount is included in the 2019 budget to cover the costs of Montgomery & Associates work, if such work needs to be done.

The full cost of the geochemical modeling being performed in 2018 is being borne by the three proponents of the projects that intend to inject new sources of water into the Basin. These are California American Water, MPWMD, and Monterey One Water (formerly MRWPCA).

It is anticipated that, if Montgomery & Associates needs to perform work on this Task in 2019, these same parties will reimburse the Watermaster for all of the costs to perform this work Therefore, there should be no net cost to the Watermaster for the work of this Task.

No new monitoring wells are planned for installation in 2019. Consequently, no monies are budgeted in the M&MP Capital Budget for 2019.

Basin Management Database

Pertinent groundwater resource data obtained from a number of sources has been consolidated into the Watermaster's database to allow more efficient organization and data retrieval. No modifications or enhancements to the database are planned in FY 2018.

Enhanced Monitoring Well Network

The Seaside Basin M&MP uses an Enhanced Monitoring Well Network to fill in data gaps in the previous monitoring well network used by the Monterey Peninsula Water Management District (MPWMD), and others, in order to improve the Basin management capabilities of the Watermaster. The Enhanced Monitoring Well Network has been described in detail in previous Watermaster Annual Reports. It continues to be used to obtain additional data that is useful to the Watermaster in managing the Basin.

Basin Management Action Plan (BMAP)

HydroMetrics LLC was hired by the Watermaster to prepare the original BMAP which contains these Sections:

- Executive Summary
- The Background and Purpose of the Plan
- The State of the Basin
- Supplemental Water Supplies (long-term water supply solutions)
- Groundwater Management Actions (to be taken as interim measures while long-term supplies are being developed)
- Recommended Management Strategies
- References

The Final BMAP was approved by the Watermaster Board at its February 2009 meeting, and the Executive Summary from the BMAP was contained in Attachment 9 of the 2009 Annual Report. That complete document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/.

The Watermaster had the BMAP updated in 2018, and the Executive Summary of the updated BMAP is contained in Attachment 12 of this Annual Report. The full document is posted under the "Postings and Records" tab of the Watermaster's website at http://www.seasidebasinwatermaster.org/.

Key findings from updating the BMAP are:

Xxx
Xxx
Xxx

NOTE: REPORTING ON THE BMAP UPDATE WILL BE COMPLETED AFTER THE DOCUMENT HAS BEEN APPROVED BY THE BOARD.

Seawater Intrusion Response Plan

HydroMetrics LLC was hired by the Watermaster to prepare a long-term Seawater Intrusion Response Plan (SIRP), as required in the M&MP.

The Final SIRP was approved by the Watermaster Board in 2009 and a summary of the Seawater Intrusion Contingency Actions from the SIRP were contained in Attachment 10 of the 2009 Annual Report. The complete document may be viewed and downloaded from the Watermaster's website at: http://www.seasidebasinwatermaster.org/. No modifications to the SIRP were made in 2018.

Seawater Intrusion Analysis Report

The SIAR examines the "health" of the Basin with regard to whether or not there are any indications that seawater intrusion is either occurring or is imminent. Previous SIARs have stated that depressed groundwater levels, continued pumping in excess of recharge and fresh water inflows, and ongoing seawater intrusion in the nearby Salinas Valley all suggest that seawater intrusion could occur in the Seaside Groundwater Basin.

The Watermaster retained Montgomery & Associates to prepare the WY 2018 Seawater Intrusion Analysis Report (SIAR) required by the M&MP. The WY 2018 SIAR provided an analysis of data collected during that Water Year.

The 2018 SIAR reported that the evaluation of the data from the sampling and monitoring program continued to indicate that seawater intrusion was not occurring.

The SIAR is lengthy, but the full *Executive Summary Section* from it is provided in Attachment 8. A complete copy of the document is posted for viewing and downloading from the Watermaster's website at: http://www.seasidebasinwatermaster.org/. All recommendations contained in the SIAR are being or will be carried out and are included in the budgeted activities contained in Attachment 6 and described in Attachment 9.

The Watermaster continues to analyze the data that is being gathered at the various monitoring sites in order to keep a close watch on the conditions within the Basin, as discussed under the "Enhanced Monitoring Well Network" heading above. Because none of the data indicates the presence of seawater intrusion, the Watermaster does not at this time plan to move forward with the Work Plan to investigate sources of fluctuating chlorides in the Sentinel Wells, as described in Attachment 12 of the 2017 Annual Report. However, should future data warrant it, the Watermaster may reconsider undertaking the initial phase of that Work Plan.

Groundwater Modeling

As projected in the 2017 Annual Report the Seaside Basin Groundwater Model, which had been updated in 2009, was again updated in 2018. The 2018 updated model was prepared by HydroMetrics LLC, and a Technical Memorandum describing the work that was performed is contained in Attachment 10. The cost of updating the model was shared through an agreement between the Watermaster, MPWMD, and Monterey One Water, with the Watermaster paying 50% of the cost, and those two other entities paying the other 50% of the cost.

Principle Findings from Updating the Seaside Basin Groundwater Model.

1. Simulated groundwater levels are sensitive to the specified heads along the northeastern boundary with the Salinas Valley. The behavior of the boundary was found to impact the calibration of areas of the model at some distance from the boundary. It was found that in the absence of the most recent Salinas Valley Integrated Hydraulic Model (SVIHM), currently being developed by the USGS, assigning boundary head elevations that match the general observed average groundwater levels along the boundary is more important than capturing smaller scale seasonal fluctuations along the boundary. It is recommended that when the SVIHM has been completed, an assessment of how well it simulates historical groundwater conditions in the Seaside Basin be conducted. If it is concluded that the new data improves simulation of groundwater level in the Seaside Basin, the boundary condition can be revised using parts of the SVIHM that improve model calibration of the Seaside Basin model.

2. The model recalibration improved calibration statistics over the original 2009 model calibration. As a result, simulated groundwater levels throughout the model, as a whole, better match observed groundwater levels.

3. The groundwater model should be updated in a maximum of five years and its calibration reevaluated at that time. However, if groundwater related projects are implemented in the basin before that time, the update and calibration reevaluation may need to be performed sooner.

Coordination of Watermaster's Seaside Groundwater Model with Salinas River Basin Model

As reported in the 2017 Annual Report the Monterey County Resource Management Agency is having its model of the Salinas Valley Groundwater Basin updated. That model is referred to as the SVIHM. In 2017 the County determined that the Technical Advisory Committee (TAC) it had convened to assist in the preparation of the updated model had fulfilled its purpose, and there have not been any subsequent meetings of that TAC since then. However, if the County reconvenes their TAC, the Watermaster will participate in future meetings of that TAC in order to ensure that the SVIHM coordinates well with the Watermaster's Seaside Basin model.

Geochemical Modeling

When new sources of water are introduced into an aquifer, with each source having its own unique water quality, there can be chemical reactions that may have the potential to release minerals which have previously been attached to soil particles, such as arsenic or mercury, into solution and thus into the water itself. This has been experienced in some other locations where changes occurred in the quality of the water being injected into an aquifer. MPWMD's consultant (Pueblo Water Resources) has been using geochemical modeling to predict the effects of injecting Carmel River water into the Seaside Groundwater Basin under the ASR program.

In order to predict whether there will be groundwater quality changes that will result from the introduction of desalinated water and additional ASR water (under the Monterey Peninsula Water Supply Project) and advance-treated wastewater (under the Pure Water Monterey Project) a geochemical model is being developed by Pueblo Water Resources for use in the areas of the Basin where injection of these new water sources will occur. The geochemical model is described in Attachment 12. The plan is to perform the geochemical modeling work in the following manner:

Step 1: Pueblo Water Resources will use the water quality and water delivery schedule data provided by each of the project proponents to develop and run the geochemical model. If the geochemical modeling indicated there will be no water chemistry problems then there would be no need perform Step 2.

Step 2 (if needed): If the geochemical modeling in Step 1 indicates the potential for problems to occur, then Montgomery & Associates will use the Watermaster's Seaside Basin groundwater model, and information about injection locations and quantities, injection scheduling, etc. provided by MPWMD for each of these projects, to develop model scenarios to see if the problem(s) can be averted by changing delivery schedules and/or delivery quantities. The effect of these changes would be evaluated by Pueblo Water Resources using the geochemical model. Implementing these mitigation measures would be done under a separate task that would be created for that purpose, when and if necessary.

Work on the geochemical modeling started in May 2018. Through an agreement between the Watermaster, MPWMD, California American Water Company, and Monterey One Water, the work is funded entirely by the three parties that are the sponsors of the aquifer recharge projects described above, at no cost to the Watermaster.

As of the date of preparation of this 2018 Annual Report, progress on this work has been as follows:
NOTE: THE FOLLOWING PARAGRAPHS MAY BE UPDATED IF ADDITIONAL PROGRESS IS REPORTED BEFORE THIS ANNUAL REPORT IS FILED.

Initial review of the available data from these aquifer recharge projects indicated that less-than-adequate information existed for purposes of performing the geochemical modeling work. Initial work has therefore focused on filling data gaps and obtaining complete mineralogical data on the Santa Margarita formation. Data compilation to date includes the following:

- Sample collection and analysis of the effluent from the PWM pilot facility is being analyzed for both base water quality constituents and bench-scale testing for leaching potential with Santa

Margarita formation mineral samples obtained in September 2018 from the construction of one of the PWM injection wells.

- The bench scale protocol described above is also being repeated using treated, potable Carmel River water from Cal-Am's Begonia Iron Removal Plant (which provides water for the ASR project and is located in Carmel Valley) to further assess findings from 2009 testing of the water supplies from that plant. This data will also be used in the overall geochemical assessment.
- Santa Margarita formation cuttings collected from the PWM injection well are being analyzed by X-Ray Diffraction (XRD) which is used to determine minerology by shining X-Rays at a solid and measuring the diffraction pattern, as well as by conventional mineralogy assessment. The samples are being further analyzed via complete acid digestion to quantify the presence and composition of trace metals within the Santa Margarita formation matrix. Results of this assessment may lead to further analysis via Dynamic Secondary Ion Mass Spectrometry (SIMS) to further identify mineral compositions prior to geochemical interaction modeling. SIMS uses an ion stream to pulse at a surface and then measures the cast-off ions in a mass spectrometer to determine the elemental state of minerals.

It is anticipated that results from these tests will be available by mid-December, at which time it will be possible to proceed with the modeling work itself.

The planned schedule once the modeling work itself begins is as follows:

- Develop the geochemical model – estimated task duration 3 weeks
- Model mixing rations – estimated task duration 6 weeks

After these tasks have been completed (expected before the end of the first quarter of 2019) Pueblo Water Resources will provide a Technical Memorandum summarizing the results of the modeling and recommendations for additional model scenarios, if any, based on the initial output runs.

If the initial modeling work identifies mixture simulations that show undesirable geochemical reactions (i.e. mineral precipitation or gas evolution) the consultant will rerun those model simulations under various modifications of mix ratios and/or aquifer conditions to identify methods of mitigating the observed adverse reactions and to identify potential operational scenarios which would prevent such adverse geochemical reactions from occurring. If this work is needed, it is estimated that this phase (described above as Step 2) will have a duration of 4 to 6 weeks. Following that Pueblo Water Resources would develop an overall summary report and recommendations for process and/or operational changes for each project to reduce or avoid adverse geochemical reactions.

Sustainable Groundwater Management Act

As reported in the 2015 Annual Report the Watermaster Board determined that the Watermaster should monitor the development of the Salinas Valley Basin Groundwater Sustainability Agency and the State Department of Water Resources' (DWR) development of regulations pertaining to requesting boundary revisions, with the intent to collaborate with these entities as appropriate.

At the State Level

In late 2016 DWR released the final 2016 modifications to California's groundwater basin boundaries. The boundary modification request submitted by the Monterey Peninsula Water Management District (MPWMD) to remove some areas near Monterey from the Salinas Valley Groundwater Basin, and to recognize the boundaries of the Adjudicated Seaside Basin, was approved. These modifications are reflected in the basin boundary map that is now posted on the DWR website.

DWR has included new basin boundaries in its interim update of Bulletin 118, which came out in 2017. It includes the boundary of the Adjudicated Seaside Basin, as requested in the boundary modification request submitted in 2016 by the Monterey Peninsula Water Management District (MPWMD).

During 2018 DWR did not issue any new regulations, or revisions to prior regulations, that impacted the Seaside Groundwater Basin or the Watermaster. In March of 2018 the Watermaster submitted to DWR the reporting information required of it, as an adjudicated basin, under SGMA.

At the Monterey County level:

- As reported in the 2017 Annual Report, Monterey County and the Marina Coast Water District (MCWD) submitted Notifications with DWR to serve as the GSA for portions of the Salinas Valley Basin that overlapped. At its November 2017 meeting the Board of the SVBGSA approved a Coordination Agreement with MCWD to address the issue of overlapping GSA application boundaries submitted by these two parties. Essentially it provides for MCWD to carry out the Groundwater Sustainability Plan (GSP) activities within its Marina and Ord Community service areas, regardless of whether MCWD or the SVBGSA is ultimately determined by the Department of Water Resources to be the appropriate party to serve as the GSA for those areas. The Agreement is available to read and download from this URL: *https://static1.squarespace.com/static/5924cea23a0411c1b50d8fd1/t/5a00dc92c83025230c1acdd5/1510005916913/11-9-17+REVISED+Board+meeting+packet.pdf*.
  The document is included under Agenda Item No. 10 at this link. At the very end of this same link is a copy of a letter from the SWRCB providing clarification regarding certain of the issues associated with the overlapping GSA application boundaries.

- As reported in the 2017 Annual Report, the County formed the SVBGSA. During 2018 the administrative structure of the SVBGSA was developed, and the SVBGSA continued moving ahead with GSP development. An initial conclusion was that it would be preferable for the SVBGSA to prepare separate GSPs for each subbasin, and work began in late 2018 on the preparation of those GSPs. The Watermaster is participating in the development of those GSPs through its membership on the SVBGSA's Advisory Committee. This will ensure that there is close coordination between that agency and the Watermaster on matters of mutual interest.

K. Information that the Watermaster Would Otherwise Include within a Case Status Conference Statement

This Section that was added to the Annual Report beginning this year as directed by the Court in its Order Amending Judgement filed March 29, 2018. It replaces the Section that was added to the 2017 Annual Report titled "Updates to the Court" and is formatted to contain the topic headings below, which were requested by the Court in its March 29, 2018 Order.

On August 13, 2018 Watermaster's legal counsel received email notification from Judge Nichols that he would soon be withdrawing as assigned all-purpose judge in the matter of the Decision. His notification explained that there had been changes made to the Assigned Judges Program, which operates through the authority of the Chief Justice under the California Constitution. He reported, in short, that the revised program, effective July 1, 2018, dramatically reduced the availability of program days to the courts throughout the state, capped the number of days an assigned judge may serve in any year, and (retroactively) capped the total number of days (1,320) an assigned judge may serve in this capacity. Judge Nichols reported that he was one of about sixty judges who, by virtue of seldom declining the Chief Justice's request to serve, and by virtue of the fact that he had served in the program for almost ten years, had exceeded that categorical limit.

Consequently, Judge Nichols elected to conclude his service (as required) by the end of calendar year 2018, or earlier if the program requires earlier separation. In response to Judge Nichol's request for an

indication of preference on the part of the Watermaster to have a replacement judge named either from within Monterey County or to an out-of-county judge, the Watermaster's legal counsel inquired of the counsels of the parties of interest in the Decision and there was unanimous consensus that an out-of-county judge would be preferred. Based on this, it is the Watermaster's understanding that efforts are being undertaken to obtain the assignment of an out-of-county judge under the reciprocal assignment policies now in place. However, Judge Nichols cautioned that the courts are under great stress right now, and that the 50% cut in available assignment days, and the other changes which constrict the availability of experienced retired judges, may make implementation of the reciprocal assignment program problematic.

As of the date of preparation of this 2018 Annual Report, no new judge had been assigned to replace Judge Nichols.

Summary of Basin Conditions and Important Developments Concerning the Management of the Basin
The condition of the Basin is discussed in the *Water Quality*, *Seawater Intrusion Analysis Report*, and *Basin Management Action Plan* subheadings in Section J of this Annual Report.

In summary, the *Seawater Intrusion Analysis Report*, which analyzes the water quality data collected under the Watermaster's sampling program, found that no seawater intrusion is being detected within the Basin. The updated *Basin Management Action Plan* found that in spite of recent pumping at levels less than the Decision-established Natural Safe Yield of 3,000 AFY, water levels in some portions of the Basin are continuing to drop. It is expected that once the MPWSP becomes operational and CAW is able to further reduce its pumping from the Basin by 700 AFY through its 25-year overpumping repayment program, the rate of drop in groundwater levels will be at least partially mitigated.

Planned Near and Long-term Actions of the Watermaster
Near-term actions are described in the 2019 Monitoring and Management Program discussed in Section J and Attachment 9 of this Annual Report.

Long-term actions will include:

- Continuing to carry out the duties and responsibilities assigned to the Watermaster by the Decision
- Continuing to coordinate with the Monterey County Resources Agency in their development of an updated hydrogeologic model of the Salinas Valley Basin, as discussed under the *Coordination of Watermaster's Seaside Groundwater Model with Salinas River Basin Model* subheading in Section J of this Annual Report
- Continuing to coordinate with the Salinas Valley Basin Groundwater Sustainability Agency to develop measures to mitigate the problem of falling water levels in the eastern portion of the Laguna Seca Subarea, as discussed under the *Sustainable Groundwater Management Act* subheading in Section J of this Annual Report.

Information Concerning the Status of Regional Water Supply Issues
Implementation of the Monterey Peninsula Water Supply Project (MPWSP) continues to be vigorously pursued by California American Water.

On September 20, 2018 the CPUC issued its decision approving a modified MPWSP consisting principally of a reduced-size 6.4 mgd desalination plant (size originally proposed was 9.6 mgd with no reclaimed water), 3,500 AFY of PWM reclaimed water, and increased ASR water; adopting settlement agreements to resolve conflicts relating to the desalination project; issued a Certificate of Public Convenience and Necessity; and certified the combined EIR/EIS for that Project. California American Water is in the process of seeking necessary approvals from the California Coastal Commission and other permitting agencies.

Construction of the first major element of the MPWSP, the Monterey Pipeline, was completed in September 2018. The Monterey Pump Station, which will pump water through this pipeline, was completed in August 2018. The pipeline will carry PWM water that is recovered after storage in the Basin, desalination water, and expanded Aquifer Storage and Recovery (ASR) water between the northern portions of the California American Water system overlying the Seaside Basin to southern portions of the system. The pipeline extends about 7 miles from the City of Seaside to the City of Pacific Grove.

Construction work is well underway on Monterey One Water's (M1W) PWM recycled water project in Marina. This project will produce approximately 3,500 AFY of advanced treated recycled water that will be delivered to the Seaside Basin for injection into the Basin and subsequent recovery and service to California American Water customers. M1W has also executed an agreement with Marina Coast Water District (MCWD) to use an MCWD pipeline that will convey the water from the PWM advanced water treatment plant to the Seaside Basin. The PWM component of the MPWSP is currently projected to become operational in late 2019. Construction of the desalination plant is currently scheduled to begin in late 2019. The desalination plant and the expanded ASR system are expected to become operational in late 2021. Detailed quarterly update reports on the MPWSP are posted on the MPWSP website at https://www.watersupplyproject.org.

On October 12, 2018 MCWD filed with the California State Supreme Court a petition for writ of review/mandate challenging the CPUC's Certificate of Public Convenience and Necessity for the MPWSP. A copy of that filing can be found at this website:

https://urldefense.proofpoint.com/v2/url?u=https-3A__www.truefiling.com_-5Flayouts_ElectronicFile.Transaction_ViewFile.ashx-3FRecord-3DODMyMmJlM2FkN2NmNDQ5ZjgwOTAxOGMzM2RlZmIxOWRodHRwOi8vdm1lZmlsZXdmZToxNzIxMC9DQVNDL192dGlfYmluL2VsZWN0cm9uaWNmaWxlL3JlY29yZC5zdmM-253dz&d=DwMFaQ&c=wT9hcAyWecHwFHlf1ZE3OA&r=V4tl7lZiDi6ultQgjV6It2X6AYBz_BYd1iioVZUXNLI&m=scsMLvJ_6PYf6SpBqyB3o27c-RQ4OrqNhbFWTnkCxbE&s=lZxL1SbZ6-yt0-euiE0JqvCCPUGzJxihxMVmilexPis&e=

That matter is going through the legal process, so it is not possible to report on the outcome of that litigation.

Management Activities that May Bear on the Basin's Wellbeing

1. *Water Conservation***.** From a water conservation standpoint, customers of Cal-Am are doing an exceptional job. California American Water's Monterey system has one of the highest levels of voluntary conservation in the state. There has essentially been no back-off in conservation following the end of mandatory conservation that occurred after the wet winter of 2016-2017.

2. *Storm Water and Recycled Water*. Storm water and recycled water are both components of the Pure Water Monterey (PWM) project that is being implemented by Monterey One Water (formerly Monterey Regional Water Pollution Control Agency). Cal-Am has already contracted to receive 3,500 AFY of PWM recycled water for injection into, and recovery from, the Seaside Basin by Cal-Am. Monterey One Water, in coordination with others, is looking at the potential to expand the delivery capacity of the PWM project by using additional sources of recycled water and storm water.

3. *Sustainable Groundwater Management Act*. Coordination between the Watermaster and the Salinas Valley Groundwater Basin Sustainability Agency is ongoing and is discussed in more detail under Section J of this Annual Report. That coordination will aid in groundwater management of the Laguna Seca and Corral de Tierra subareas.

4. Climate Change. Higher seawater levels could exacerbate seawater intrusion concerns, which punctuates the importance of monitoring and long-term management to avoid seawater intrusion. From a water supply perspective, reliance on groundwater with sustainable management is ideal because the resource is a reservoir and therefore not subject to sharp fluctuations in availability resulting from year-to-year precipitation amounts as is the case with surface water supplies. Updating of the Watermaster's *Groundwater Model* and *Basin Management Action Plan* in 2018 (discussed in Section J) incorporated projected impacts from climate change and sea level rise.

5. Potential Replenishment of the Basin with Water Purchased from Marina Coast Water District (MCWD). As mentioned in the 2017 Annual Report and in the March 2018 Status Conference Statement, the Watermaster received an initial proposal, and later a revised proposal, from Marina Coast Water District (MCWD) (not a party to the Decision) to sell replenishment water to the Watermaster. The Watermaster Board and its Technical Advisory Committee studied the proposals but found that insufficient information was provided to determine whether they were viable. Then, in May of 2018 Watermaster staff was informed by MCWD that the revised proposal was "on hold." In September of 2018 the CPUC found that the proposal was not shown to be a reliable, secure supply at a reasonable price. Therefore, the Watermaster does not plan to take any further action on the MCWD proposal.

6. *New Technical Issues or Activities.* This is a new Section added beginning with this 2018 Annual Report, in response to the Court's request during the March 2017 Status Conference that it be updated on any new technical issues of interest to the Watermaster.

- *Electrical Resistivity Tomography in the Monterey Bay Area*.

The FEIR/FEIS for California American Water's Monterey Peninsula Water Supply Project was released for public review in March 2018. A topic of previous interest to the Watermaster, electrical resistivity tomography, was discussed in Section 8.2.9.1 of the FEIR/FEIS, a portion of which is excerpted below:

> *"In May 2017, Dr. Knight and graduate students conducted a third geophysical study consisting of an airborne geophysics survey of the coastal area of the Salinas Valley Groundwater Basin near Marina, extending inland from the Monterey Bay to Highway 183 and the Armstrong Ranch. A portion of the survey was also conducted off the Monterey Bay coast to capture and correlate resistivity data from the hydrogeology and water quality within the geologic units underlying the Bay. The survey employed a method known as Time Domain Electromagnetics (TEM); SkyTEM, a Denmark-based company, collected the survey data. SkyTEM introduced airborne geophysical surveys for groundwater studies around 2011 and has applied this technology in various applications throughout the world. The SkyTEM antenna, which is suspended from a helicopter at a height of about 150 feet above the ground, generates a primary magnetic field that is directed downward. This creates a secondary magnetic signal that is returned and detected by the receiver. The received signal is then converted to resistivity data and that data is inverted to produce output like that obtained from ERT. The SkyTEM survey, hereafter referred to as Airborne Electromagnetics (AEM), was conducted for MCWD and was designed to provide resistivity data that can be linked to the extent of seawater intrusion at the coast and further inland. Dr. Knight and graduate researcher Ian Gottschalk prepared a report in June 2017 (Gottschalk and Knight, 2017) with the preliminary interpretation of the AEM data acquisition and the initial results of the AEM survey were publicly presented to the Marina City Council on August 8, 2017 and provided to the Lead Agencies by MCWD in November 2017; see Section 8.5.2. The analysis of the AEM survey data relied on subsurface information provided by geophysical borehole logs from Cal Am's nine monitoring well clusters installed in 2015 as part of the MPWSP Hydrogeologic Investigations Workplan. Preliminary results of the AEM study are discussed below in Section 8.2.9.2."*

Because of the statement in this Section that this technology had been used "…off the Monterey Bay coast…" the Watermaster was interested in knowing if this technology had progressed to the point where it could detect the presence of seawater intrusion in freshwater aquifers underlying the Bay. Section 8.9.2.2 of the FEIR/FEIS is titled *"ERT/AEM Requires Ground-Truthing: Correlation with Actual Subsurface Data* "and discusses the work described in Section 8.2.9.1.

Section 8.9.2.2 included a number of findings pertaining to the work described in Section 8.2.9.1, including:

- While the salinity of the groundwater in aquifers can change subsurface resistivity measurements in seawater intruded areas, differences in the character of the subsurface geologic materials can also alter the measured resistivity. Moreover, ERT/AEM requires correlation and ground truthing with known data points that describe the geologic, groundwater, and water chemistry. In the case of a 2011 ERT survey performed along the Monterey Bay coastline near the former Fort Ord, data from four monitoring wells, including induction logging and lithologic logs, were used to help interpret the ERT data. In another ERT survey performed in the Monterey Bay area in 2014, downhole geophysical logs (E- logs) and drillers' reports were used to help interpret the ERT data. ERT/AEM technology has the potential to augment subsurface data on seawater intrusion and subsurface groundwater conditions, but it cannot be considered a replacement for intrusive methods to evaluate the subsurface and groundwater aquifers (exploratory boreholes, groundwater monitoring wells, down-hole geophysics and modeling) because ERT/AEM has certain limitations.
- Any data obtained using ERT/AEM would require verification and correlation through ground-truthing using groundwater monitoring wells and other subsurface data as control points. Without adequate ground-truthing or control points with actual subsurface lithology and water chemistry data, the ERT data could not be calibrated to actual site conditions.
- For each area that is surveyed complementary data from wells or other sources is needed to transform the measured electrical resistivity measurements into relative salinity or TDS concentrations. Electrical resistivity depends on knowing both subsurface lithologic conditions and measured salinity or TDS concentrations of the groundwater.
- The preliminary findings of the 2017 AEM survey show the bulk resistivity of the aquifer sediments combined with the resistivity of the water in those sediments but does not convert those resistivities to represent the actual groundwater quality. The final AEM report, which may provide that correlation, is expected in spring 2018.
- ERT/AEM resolution decreases with depth and is less able to distinguish subtle changes in subsurface conditions as the depth increases. It is important to use a combination of ERT data and traditional subsurface data (i.e. data from well bore logs, groundwater levels) to better understand the distribution of seawater intruded groundwater and fresher groundwater on a groundwater basin scale.
- As with ERT results, AEM data must be ground-truthed and correlated with the actual subsurface geology and water chemistry information using well logs, induction logs, and groundwater sampling results as control points. This is especially true for AEM assessments of seawater intrusion and identification of the seawater intrusion front. The challenges with using AEM survey results to identify seawater intrusion and the seawater intrusion front could include difficulty resolving subtle changes in subsurface resistivity, identifying decreases in resistivity that do not necessarily indicate a decrease in salinity/TDS concentration, and capturing lateral resistivity changes that correlate with geologic conditions rather than water quality.

To determine whether ERT/AEM technology could be used to help detect the location of the seawater intrusion front offshore of the Seaside Groundwater Basin, the Watermaster's Technical Program Manager contacted Ms. Rosemary Knight and Mr. Adam Pidlisecky, who were authors of the reference reports cited in the FEIR/FEIS for the ERT/AEM work described in Section 8.2.9.1.

Ms. Knight responded that she was dealing with a family medical issue and was not in a position to respond to questions at that time.

Mr. Pidlisecky had made a presentation to the Watermaster's Technical Advisory Committee on this technology several years ago, and at that time reported that the technology could not be used to locate the seawater intrusion front offshore, because the aquifers were deep and the overlying seawater in the Bay would prevent the front from being detected. When contacted again in April 2018 he responded that the technique used in the 2017 survey is not well suited to offshore work, because saltwater attenuates the signal. Having 100% saltwater overlying the seafloor, beneath which lie the aquifers, severely attenuates the signal and greatly limits the depth of investigation. He said that although people have used the technique over water, it has usually been done on a much smaller scale, only over a length of a few hundred meters as opposed to kilometers such as was done in the 2017 survey.

Based on the findings of the FEIR/FEIS and Mr. Pidlisecky's response, it continues to appear that the use of ERT/AEM technology to locate the seawater intrusion front offshore of the Seaside Groundwater Basin is not feasible.

- *Stormwater Projects Being Evaluated in the Monterey Peninsula Stormwater Resource Plan (SWRP).*

Monterey One Water (M1W), formerly the Monterey Regional Water Pollution Control Agency (MRWPCA), was the lead entity in the development of a Stormwater Resource Plan (SWRP) for the Monterey Peninsula, Carmel Bay, and South Monterey Bay (Monterey Peninsula) Integrated Regional Water Management (IRWM) Planning Area. A Consultant Project Team consisting of Geosyntec Consultants, Inc. (Geosyntec), EOA, Inc. (EOA), and Denise Duffy & Associates, Inc. (DD&A) prepared the SWRP and conducted associated analyses. Preparation of the Monterey Peninsula SWRP was funded by a Proposition 1 Planning Grant and local match funds, including the locally funded Monterey Peninsula Water Recovery Study Report, the results of which are integrated into the SWRP.

The purpose of the SWRP is to identify stormwater capture project opportunities that could be utilized as new water supply sources for the Monterey Peninsula and provide additional water quality and environmental benefits. The purpose of the Monterey Peninsula Water Recovery Study, which was conducted as part of the development of this Monterey Peninsula Region SWRP, was to examine the feasibility of establishing a Peninsula-wide water recovery and reclamation system, including identifying and evaluating potential projects that could capture sources of wet and dry weather runoff within the Monterey Peninsula IRWM Planning Area for water recovery and use. The water recovery projects were specifically identified based on their potential to reduce the Peninsula's dependence on the Carmel River, Carmel Valley Alluvial Aquifer, and adjudicated Seaside Groundwater Basin. The study considered how to store, treat, and transport potential sources of runoff prior to entering existing water and wastewater infrastructure for use, but did not identify projects that expand existing water distribution and wastewater storage, treatment, and conveyance system capacities, or determine if this will be needed.

Seven projects were selected for conceptual design in the SWRP. Six of the seven projects would have the potential to slightly increase flows to the M1W reclamation facilities, and thus have the potential of modestly augmenting wastewater flows to the M1W reclamation facilities. This could help enable the PWM project to produce a small amount of additional water for use in recharging, or reducing pumping from, the Seaside Groundwater Basin. Since these projects are in the early planning stages and are not currently funded or otherwise being pursued by project sponsors, they are considered only to be potential sources of water that M1W could use to increase the capacity of its PWM project. Thus, no specific quantities of water that would be used for the benefit of the Seaside Groundwater Basin can currently be identified for these projects. However, none of these six projects would have the capability of capturing more than a few acre-feet of stormwater per year.

The seventh project lies within the watershed of the City of Carmel-by-the-Sea and would not be of benefit to the Seaside Basin.

L. Conclusions and Recommendations

The Seaside Basin Watermaster Board has worked diligently to meet all of the Court's established deadline dates. All of the Phase 1 Scope of Work activities, which are described in the "Implementation Plan for the Seaside Basin Monitoring and Management Program" dated March 7, 2007, have been completed. At the Watermaster Board meeting held on October 3, 2018 the Board adopted the FY 2019 budgets contained in Attachment 6, which support carrying out all elements of the "Seaside Groundwater Basin Monitoring and Management Program 2019 Work Plan." That Work Plan describes the M&MP activities that will be conducted during Fiscal Year 2019. A copy of this Work Plan is contained in Attachment 9.

As described in Section J above, information from the Enhanced Monitoring Well Network is being utilized to detect any seawater intrusion. The response actions described in the Watermaster's Seawater Intrusion Response Plan, which was contained in the 2009 Annual Report, will be implemented if seawater intrusion is detected within the Basin.

As of the date of preparation of this 2018 Annual Report no future status conferences with the Court to provide an update on certain of the Watermaster's activities has been scheduled.

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	6
AGENDA TITLE:	Draft Agreement with Cal Am and MPWMD for Storage and Recovery of Water from the Pure Water Monterey Project
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

At its March 14, 2018 meeting the TAC approved the joint application from Cal Am and MPWMD to store and recover water from the Pure Water Monterey Project in the Seaside Basin. The Board approved that application at its October 3, 2018 meeting. Using the data and information contained in that application, I prepared the attached Draft Agreement for Storage and Recovery of Water in the Seaside Basin. The format of this Draft is similar to the Agreement with Cal Am for storage of ASR water in the Basin that was issued by the Watermaster on October 21, 2011.

The attached Draft was provided to Cal Am and MPWMD for their review, and reflects edits they suggested to it.

Following TAC approval of the Draft Agreement it will go to the Board for their consideration. That will occur at the Board's January 2, 2019 meeting, if the TAC approves the Draft Agreement at today's meeting.

ATTACHMENTS:	Draft Agreement
RECOMMENDED ACTION:	Approve the Draft Agreement as-presented, or make edits to it prior to approval

AGREEMENT FOR STORAGE AND RECOVERY OF NON-NATIVE WATER FROM THE SEASIDE GROUNDWATER BASIN

THIS AGREEMENT is made and entered into on_____, _____, by and between the SEASIDE BASIN WATERMASTER (the "WATERMASTER"), California-American Water Company (the "PRODUCER"), and the Monterey Peninsula Water Management District (the "DISTRICT") as follows:

Recitals

1. The WATERMASTER was created by the Amended Decision of the Monterey County Superior Court, filed February 9, 2007, Case No. M66343 (the "Decision"). This Decision was made for the purposes of managing and protecting the Seaside Groundwater Basin ("Basin") for the benefit of the businesses, individuals, and public agencies that overlie or extract groundwater from the Basin. PRODUCER and DISTRICT are parties to the Decision.

2. In February of 2010, the WATERMASTER, in accordance with Section III.3.L.3.j.xix and III.H.2 of the Decision, allocated 28,784 acre-feet of Storage in the Coastal and Northern Inland Subareas to the PRODUCER. In accordance with Section III.H.3 of the Decision, PRODUCER may use its Storage Allocation for the benefit of its customers and for other purposes as PRODUCER deems appropriate.

3. Section III.H.1 of the Decision states that the Parties shall be permitted to utilize available Storage space for "bona fide Groundwater Storage Projects." Further, Section III.Q of the Decision states that: (a) DISTRICT can store water for the benefit of DISTRICT in the Basin; and (b) the Decision preserves DISTRICT's statutory right to store water in subterranean reservoirs.

4. The PRODUCER and WATERMASTER have an existing *Agreement for Storage and Recovery of Non-Native Water from the Seaside Groundwater Basin* dated October 21, 2011, which authorizes PRODUCER to store 2,426 acre-fee per year of Non-Native water in, and to subsequently recover that stored water from, the Basin.

5. In accordance with the *Water Purchase Agreement for Pure Water Monterey Project* made by and between PRODUCER, DISTRICT, and MONTEREY ONE WATER ("M1W") (formerly the Monterey Regional Water Pollution Control Agency) dated September 19, 2016 (the "WPA"), incorporated herein by this reference, the DISTRICT will deliver for the benefit of PRODUCER advanced treated recycled water from the Pure Water Monterey project (the "AWT Water") to the Basin for injection, storage, and recovery from the Basin.

6. PRODUCER and DISTRICT have applied to the WATERMASTER for permission to, using PRODUCER's Storage Allocation, Store the AWT Water in, and subsequently recover that Stored Water from, the Basin.

7. Under the authorities granted to the WATERMASTER by the Decision, on October 3, 2018 the WATERMASTER approved the application of the PRODUCER and the DISTRICT and hereby grants permission to the PRODUCER and the DISTRICT to store Non-Native water/AWT Water in, and to recover that stored water from, the Basin, as described in and subject to the Terms and Conditions contained in this Agreement.

Terms and Conditions

NOW, THEREFORE, in consideration of the foregoing and the mutual promises contained herein, the parties hereto agree to the following terms and conditions:

1. Definitions. Unless otherwise specifically defined herein, the defined terms shall be given the same definition and meaning set forth in the Decision, as listed in Attachment A.

2. Storage Quantity. The PRODUCER is authorized to store, by means of direct injection by DISTRICT or M1W, 6,000 acre-feet per year of the AWT Water in the Basin, which includes AWT Water used to backflush an injection well that percolates into the ground. The DISTRICT is authorized, using the PRODUCER's Storage Allocation, to store by means of direct injection up to 4,000 acre-feet of the AWT Water for the PRODUCER's future use (the "Reserve Water"). In the event the WATERMASTER revises the Total Usable Storage Space of the Basin in accordance with Section III.H.4 of the Decision, or if one or more Alternative Producers converts entirely or in part from an Alternative Production Allocation to a Standard Production Allocation in accordance with Section III.B.3.e of the Decision, the PRODUCER's Storage Allocation may change, and this may affect the storage quantity authorized by this Agreement; however, any reduction in storage quantity will not result in a corresponding reduction in the amount of AWT Water actually stored at the time of the change. In such instance this Agreement will be modified to reflect these changes. Further, the parties may agree by written amendment to this Agreement to revise the storage quantities authorized herein.

3. Storage Location(s). The storage of water authorized under paragraph 2 above will be performed at the following location(s): see Attachment B.

4. Recovery Location(s). PRODUCER is authorized to recover the AWT Water stored at the location(s) described under paragraph 3 above, which recovery must be performed within the same Subarea of the Basin as the location(s) within which it was stored. PRODUCER will recover the AWT Water at the following location(s), or at such other locations as may be approved by WATERMASTER upon written request by PRODUCER or DISTRICT:

   A. Ord Grove Well #2, 1987 Park Ct., Seaside (Santa Margarita)
   B. Paralta Well, 2104 Paralta Ave., Seaside (Santa Margarita)

C. Luzern Well #2, 1984 Luzern St., Seaside (Paso Robles)
D. Playa Well #3, 1237 Playa Ave., Seaside (Paso Robles)
E. Plumas Well #4, 1453 Plumas Lane, Seaside (Paso Robles)
F. Santa Margarita ASR-1, 1910 General Jim Moore Blvd, Seaside (Santa Margarita)
G. Santa Margarita ASR-2, 1910 General Jim Moore Blvd, Seaside (Santa Margarita)
H. Seaside Middle School ASR-3, 2111 General Jim Moore Blvd, Seaside (Santa Margarita)
I. Seaside Middle School ASR-4, 2111 General Jim Moore Blvd, Seaside (Santa Margarita)

5. Recovery Quantity. The PRODUCER is initially authorized to recover (Extract) the full amount of the AWT Water actually Stored in accordance with this Agreement. However, due to the hydrogeologic characteristics of the Seaside Basin, naturally occurring losses of Stored Water may result in the WATERMASTER reducing the percentage of Stored Water that may be Extracted. Should the WATERMASTER determine that this needs to be done, this Agreement will be modified to reflect the reduced quantity of water that the PRODUCER may recover, and the technical basis for this determination will be provided to all PRODUCERs.

6. Water Quality. The DISTRICT hereby certifies that prior to the AWT Water being introduced into the Basin for Storage in accordance with this Agreement, all such water will meet all of the requirements imposed on the DISTRICT or M1W by permits and/or approvals issued to the DISTRICT or M1W by the California Regional Water Quality Control Board and any other water quality standards imposed by any other government entity, including without limitation the California Department of Public Health and the Monterey County Department of Environmental Health.

   DISTRICT shall ensure that the water quality characteristics of the AWT Water that will be stored under this Agreement meet the "Water Treatment Guarantee" as defined in the WPA, which definition is incorporated herein by this reference, which characteristics are considered by all parties to this Agreement to not pose a threat of harm to the Basin.

   DISTRICT agrees that prior to injecting any AWT Water into the Basin for Storage, it must provide to the WATERMASTER the geochemical interaction modeling assessment (including any recommended mitigation measures) ("Modeling Assessment") contemplated by the February 10, 2018 *Memorandum of Agreement Between the Seaside Basin Watermaster, the Monterey Peninsula Water Management District, California American Water Company, and Monterey One Water to Share in the Costs of Performing Geochemical Modeling of the Seaside Basin Groundwater Basin* (see Attachment C). If the Modeling Assessment recommends implementation of mitigation measures to avoid a Material Injury (as defined in the Decision) resulting from the injection of AWT Water into the Basin, DISTRICT must, prior to the initial injection of AWT Water, demonstrate to the reasonable satisfaction of WATERMASTER that sufficient measures will be implemented to avoid Material Injury.

7. Carryover and Stored Water Credits. In accordance with Section III.F of the Decision, if during a particular Water Year the PRODUCER does not Extract from the Basin a total quantity equal to the PRODUCER's Standard Production Allocation for the particular Water Year, the PRODUCER may establish Carryover Credits, up to the total amount of the PRODUCER's Storage Allocation.

   However, in accordance with the Decision in no circumstance may the sum of the PRODUCER's Stored Water Credits and Carryover Credits exceed the PRODUCER's available Storage Allocation. Further, in accordance with Section III.H.5 of the Decision, unused (not Extracted) Stored Water Credits may be carried over from year to year, but due to the hydrogeologic characteristics of the Seaside Basin, naturally occurring losses of Stored Water may require Watermaster to discount the percentage of Stored Water that may be Extracted.

8. Measurement and Reporting of Extractions and Storage. In accordance with Section III.J of the Decision, the DISTRICT shall ensure that adequate measuring devices are installed, maintained, and used on all AWT Water injection facilities, and the PRODUCER shall ensure that adequate measuring devices are installed, maintained, and used on all of PRODUCER's Extraction facilities, as required by the WATERMASTER's Rules and Regulations and this Agreement.

   Beginning on the initial delivery of AWT Water to the Basin for Storage in accordance with this Agreement, the DISTRICT shall provide to the WATERMASTER a monthly injection report containing the following data for the preceding month:
   - The quantity of AWT Water that was injected by the DISTRICT for delivery to PRODUCER (defined as "Company Water" in the WPA, which definition is incorporated herein by this reference)
   - The quantity of AWT Water that was injected by the DISTRICT as Reserve Water
   - The location(s) where the water was injected

   Beginning on the initial delivery of Company Water by the DISTRICT to the PRODUCER in accordance with the WPA, the PRODUCER shall provide to the WATERMASTER, as part of each monthly Production Report, data for the reporting period stating:
   - The quantity of Company Water that was recovered (Extracted)
   - The location(s) where the Company Water was recovered (Extracted)

9. Indemnification. The PRODUCER shall assume the defense of, indemnify and hold harmless, the WATERMASTER, its officers, agents and employees from all claims, liability, loss, damage or injury of any kind, nature or description arising directly or indirectly from actions or omissions by the PRODUCER or any of its officers, agents, employees, or independent contractors relating to this Agreement, excepting claims, liability, loss, damage or injury which arise from the willful or negligent acts, omissions, or activities of an officer, agent or employee of the WATERMASTER.

   The DISTRICT shall assume the defense of, indemnify and hold harmless, the

WATERMASTER, its officers, agents and employees from all claims, liability, loss, damage or injury of any kind, nature or description arising directly or indirectly from actions or omissions by the DISTRICT or any of its officers, agents, employees, or independent contractors relating to this Agreement, excepting claims, liability, loss, damage or injury which arise from the willful or negligent acts, omissions, or activities of an officer, agent or employee of the WATERMASTER.

10. Successors and Assigns. This Agreement, and all the terms and conditions hereof, shall apply to and bind the successors and assigns of the respective parties hereto; provided that the PRODUCER and the DISTRICT shall not assign this Agreement without prior written consent of the WATERMASTER.

11. Further Cooperation. Each of the parties agree to reasonably cooperate with each other, and to execute and deliver to the other all such documents and instruments, and to take such further actions, as may reasonably be required to give effect to the terms and conditions of this Agreement.

12. Interpretation. It is agreed and understood by the parties hereto that this Agreement has been arrived at through negotiation and that no party is to be deemed the party which prepared this Agreement within the meaning of Civil Code §1654. The provisions of this Agreement shall be interpreted in a reasonable manner to effect the purpose of the parties and this Agreement.

13. Disputes. If any dispute under this Agreement arises the parties shall first meet and confer in a good faith attempt to resolve the matter between themselves. Each partyshall make all reasonable efforts to provide to the other parties all the information that the party has in its possession that is relevant to the dispute, so that all parties will have ample information with which to reach a decision. If the dispute is not resolved by meeting and conferring, the matter shall be submitted to the Court for resolution pursuant to the Court's reserved jurisdiction as set forth in the Decision.

14. Modification. This Agreement may be amended, altered or modified only by a writing, specifying such amendment, alteration or modification, executed by authorized representatives of each of the parties hereto.

15. Attorney's Fees and Costs. In the event it should become necessary for any party to enforce any of the terms and conditions of this Agreement by means of court action or administrative enforcement, the prevailing party/parties, in addition to any other remedy at law or in equity available to such party, shall be awarded from the non-prevailing party/parties all reasonable costs and reasonable attorney's fees in connection therewith, including the fees and costs of experts reasonably consulted by the attorneys for the prevailingparty/parties.

16. Counterparts. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall be deemed to constitute one and the same instrument.

17. Written Notice. Written notice shall be deemed to have been duly served if delivered in person or by mail to the individuals and at the addresses listed below:

A. WATERMASTER:
Administrative Officer
Seaside Basin Watermaster
P.O. Box 51502
Pacific Grove, CA 93950

B. PRODUCER:
Director of Operations
California American Water
511 Forest Lodge Road, Suite 100
Pacific Grove, CA 93950

C. DISTRICT:
General Manager
Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, CA 93940

18. Conflicts with the Decision. The Parties believe this Agreement to be consistent with the terms of the Decision and agree that the PRODUCER's and DISTRICT's rights under this Agreement are subject to the Decision and in the event of any conflict between the provisions of this Agreement and the Decision, the Decision shall control.

19. Entire Agreement. This Agreement constitutes the entire and complete agreement between the parties regarding the subject matter hereof, and supersedes all prior or contemporaneous negotiations, understandings or agreements of the parties, whether written or oral, with respect to such subject matter.

20. Term. This Agreement shall be effective on the date it has been executed by all Parties and shall be coterminous with the WPA.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement consisting of seven (7) pages and three (3) attachments in triplicate on the date hereinabove written.

WATERMASTER

By_____
Ralph Rubio
Chairperson

PRODUCER

By_____
Garry Hofer
Vice President, Operations

DISTRICT

By_____
David Stoldt
General Manager

ATTACHMENT A

DEFINITIONS
(Excerpted from the Decision)

"Artificial Replenishment" means the act of the WATERMASTER, directly or indirectly, engaging in or contracting for Non-Native Water to be added to the Groundwater supply of the Seaside Basin through Spreading or Direct Injection to offset the cumulative Over-Production from the Seaside Basin in any particular Water Year pursuant to Section III.L.3.j.iii. It shall also include programs in which Producers agree to refrain, in whole or in part, from exercising their right to produce their full Production Allocation where the intent is to cause the replenishment of the Seaside Basin through forbearance in lieu of the injection or spreading of Non-Native Water.

"Carryover" means that portion of a Party's Production Allocation that is not Extracted from the Basin during a particular Water Year. Each acre-foot of Carryover establishes an acre-foot of Carryover Credit.

"Carryover Credit(s)" means the quantity of Water established through Carryover, that a Party is entitled to Produce from the Basin pursuant to Section III.F.

"Extraction," "Extractions," "Extracting," "Extracted," and other variations of the same noun or verb, mean pumping, taking, diverting or withdrawing Groundwater by any manner or means whatsoever from the Seaside Basin.

"Groundwater" means all Water beneath the ground surface in the Seaside Basin, including Water from Natural Replenishment, Artificial Replenishment, Carryover, and Stored Water.

"Natural Replenishment" means all processes by which Water may become a part of the Groundwater supply of the Seaside Basin without the benefit of the Physical Solution and the coordinated management it provides. Groundwater that occurs in the Seaside Basin as a result of the Physical Solution, which is not Natural Replenishment, includes, but is not limited to Storage, Carryover, and Artificial Replenishment.

"Non-Native Water" means all Water that would not otherwise add to the Groundwater supply through natural means or from return flows from surface applications other than intentional Spreading.

"Physical Solution" means the efficient and equitable management of Groundwater resources within the Seaside Basin, as prescribed by this Decision, to maximize the reasonable and beneficial use of Water resources in a manner that is consistent with Article X, Section 2 of the California Constitution, the public interest, and the basin rights of the Parties, while working to bring the Production of Native Water to Natural Safe Yield.

"Producer" means a Party possessing a Base Water Right.

"Standard Production Allocation" is the amount of Groundwater that a Producer participating in this allocation method may Produce from a Subarea of the Seaside Basin as provided in Section III.B.2, which is determined by multiplying the Base Water Right by the Operating Yield.

"Storage" means the existence of Stored Water in the Seaside Basin.

"Storage Allocation" means that quantity of Stored Water in acre feet that a Party is allowed to Store in the Coastal Subarea or the Laguna Seca Subarea at any particular time.

"Storage Allocation Percentage" means the percentage of Total Usable Storage Space allocated to each Producer proceeding under the Standard Production Allocation. Producers proceeding under the Alternative Production Allocation are not allocated Storage rights and, consequently, their share of the Total Usable Storage Space is apportioned to the Producers proceeding under the Standard Production Allocation. Pursuant to the terms of Section III.B.3, Parties proceeding under the Alternative Production Allocation enjoy a one-time right to change to the Standard Production Allocation. Due to the recalculation of the Storage Allocation Percentage necessitated when a Party changes to the Standard Production Allocation, the WATERMASTER will maintain the up-to-date Seaside Basin Storage Allocation Percentages.

"Storage and Recovery Agreement" means an agreement between WATERMASTER and a Party for Storage pursuant to Section III.L.3.j.xx.

"Store" and other variations of the same verb refer to the activities establishing Stored Water in the Seaside Basin.

"Stored Water" means (1) Non-Native Water introduced into the Seaside Basin by a Party or any predecessors-in-interest by Spreading or Directly Injecting that Water into the Seaside Basin for Storage and subsequent Extraction by and for the benefit of that Party or their successors-in-interest; (2) Groundwater within the Seaside Basin that is accounted for as a Producer's Carryover; or (3) Non-Native water introduced into the Basin through purchases by the WATERMASTER, and used to reduce and ultimately reverse Over-Production.

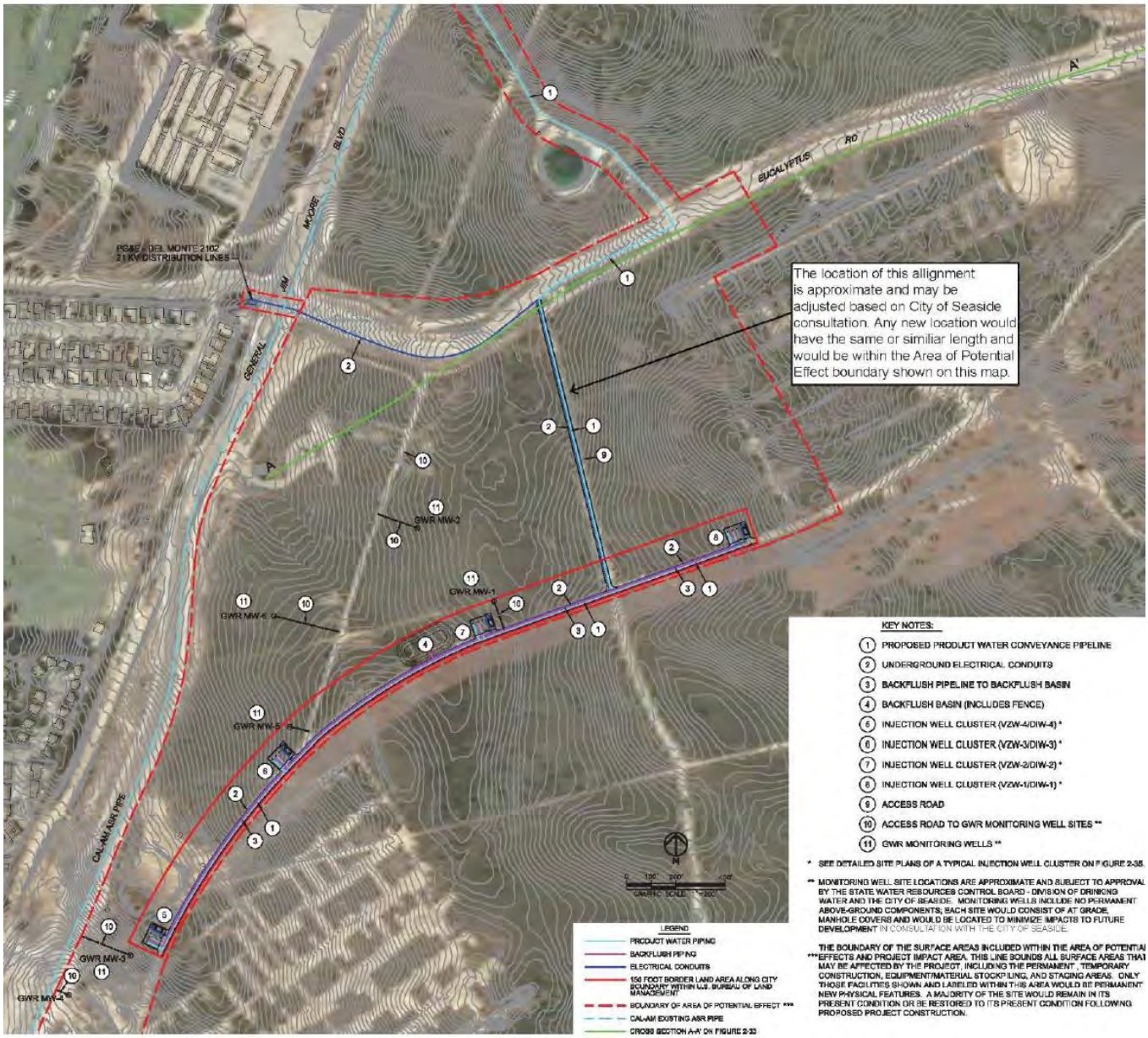
"Stored Water Credit" means the quantity of Stored Water augmenting the Basin's Retrievable Groundwater Supply, which is attributable to a Party's Storage and further governed by this Decision and a Storage and Recovery Agreement.

"Total Useable Storage Space" means the maximum amount of space available in the Seaside Basin that can prudently be used for Storage as shall be determined and modified by WATERMASTER pursuant to Section III.L.3.j.xix, less Storage space which may be reserved by the WATERMASTER for its use in recharging the Basin.

ATTACHMENT B

Delivery Point

AWT Water will be injected by DISTRICT or M1W into the Seaside Groundwater Basin using new injection wells. The proposed new Injection Well Facilities will be located east of General Jim Moore Boulevard, south of Eucalyptus Road in the City of Seaside, including up to eight injection wells (four deep injection wells, four vadose zone wells, in pairs identified as #5, #6, #7, and #8 in the figure below), six monitoring wells, and back-flush facilities.



ATTACHMENT C

MODELING AGREEMENT

MEMORANDUM OF AGREEMENT

BETWEEN THE SEASIDE BASIN WATERMASTER, THE MONTEREY PENINSULA WATER MANAGEMENT DISTRICT, CALIFORNIA AMERICAN WATER COMPANY, AND MONTEREY ONE WATER

TO SHARE IN THE COSTS OF PERFORMING GEOCHEMICAL MODELING OF THE SEASIDE BASIN GROUNDWATER BASIN

THIS AGREEMENT is made and entered into this 10th day of February, 2018, by and between the SEASIDE BASIN WATERMASTER, hereinafter referred to as the "WATERMASTER", and the MONTEREY PENINSULA WATER MANAGEMENT DISTRICT, hereinafter referred to as the "DISTRICT", CALIFORNIA AMERICAN WATER COMPANY, hereinafter referred to as "CAWC," and MONTEREY ONE WATER, hereinafter referred to as "M1W," as follows.

In this Agreement the terms "Party" and "Parties" refer to the WATERMASTER, the DISTRICT, CAWC, and/or M1W, either individually or collectively.

RECITALS:

A. The WATERMASTER was established for the purposes of administering and enforcing the provisions of the Amended Decision filed February 9, 2007 in Case No. M66343, California Superior Court, Monterey County ("Amended Decision").

B. Section L.3.j.xxi of the Judgment states in part "The Watermaster will monitor and perform or obtain engineering, hydrogeologic, and scientific studies concerning all characteristics and workings of the Seaside Basin, and all natural and human-induced influences on the Seaside Basin, as they may affect the quantity and quality of Water available for Extraction, that are reasonably required for the purposes of achieving prudent management of the Seaside Basin in accord with the provisions of this Decision."

C. Section L.3.j.xxiii of the Judgment states in part "The Watermaster will take any action within the Seaside Basin, including, but not limited to, capital expenditures and legal actions, which in the discretion of Watermaster is necessary or desirable to accomplish any of the following:

- Prevent contaminants from entering the Groundwater supplies of the Seaside Basin, which present a significant threat to the Groundwater quality of the Seaside Basin, whether or not the threat is immediate;
- Remove contaminants from the Groundwater supplies of the Seaside Basin presenting a significant threat to the Groundwater quality of the Seaside Basin;
- Determine the existence, extent, and location of contaminants in, or which may enter, the Groundwater supplies of the Seaside Basin;
- Determine Persons responsible for those contaminants; and
- Perform or obtain engineering, hydrologic, and scientific studies as may be reasonably required for any of the foregoing purposes.

D. The DISTRICT, CAWC, and M1W intend to submit application(s) to the WATERMASTER for Storage of Non-Native Water in the Seaside Basin ("Application(s)") in accordance with Section III.L.3.j.xx of the Amended Decision, which states in part: "The Watermaster will review applications for Storage in the Seaside Basin, regulate the Storage of Non-Native Water in the Seaside Basin, and issue Storage and Recovery Agreements, all as provided below. All applications for Storage in the Seaside Basin shall be considered and voted on before a noticed meeting of the Watermaster. However, all such applications shall be approved absent the issuance of findings that a Material Injury to the Seaside Basin or Producers will or is likely to occur as a result of the proposed Storage program and no reasonable conditions could be imposed to eliminate such risk. If a Storage application is approved, the Watermaster shall issue a Storage and Recovery Agreement. The Storage and Recovery Agreement may include, among other possible elements and/or provisions, the following conditions to avoid Material Injury: … (4) the particular Water quality characteristics that are required pursuant to the Storage and Recovery Agreement… and any other terms and conditions deemed necessary to protect the Seaside Basin and those areas affected by the Seaside Basin."."

E. The DISTRICT, CAWC, and M1W propose to store Non-Native Water from the following sources: (1) ASR water produced by the DISTRICT; (2) desalinated seawater produced by CAWC's Monterey Peninsula Water Supply Project ("Desal Water"), and water produced by M1W's Pure Water Monterey project ("PWM Water"). As part of carrying out its duties and responsibilities under the Amended Decision, the WATERMASTER has requested that the Application(s) include a geochemical interaction modeling assessment investigating the potential for adverse geochemical reactions resulting from the introduction of these waters into the Seaside Basin and, if applicable, identifying measures to avoid such adverse reactions.

Terms and Conditions

In consideration of the mutual promises contained herein, the WATERMASTER, the DISTRICT, CAW, and M1W hereby agree to the following terms and conditions:

A. **Work to be performed.** The DISTRICT will contract directly with its consultant, Pueblo Water Resources, Inc. ("Consultant"), to perform modeling of the proposed groundwater storage and recovery projects to assess the geochemical interaction effects of introducing the non-native water from these projects into the native water in the Basin ("Work"). The Scope of Work and the estimated costs to perform this work are described in Attachment 1 to this Agreement. The DISTRICT will invite the staff of each of the Parties to this Agreement to attend any key milestone meetings and conference calls that are held between the DISTRICT and its Consultant as the Work is being performed, in order to enable each of the Parties to stay abreast of the work, raise pertinent questions in a timely manner, and provide input as appropriate.

The Parties hereto understand, as stated in Attachment 1, that it is difficult for the Consultant to accurately estimate the costs to perform the Work, and that the costs listed in the Estimated Fee Summary of Attachment 1 are the Consultant's best estimates. In the event it is determined, during the course of the Work, that the cost to complete the Work will be greater than the total cost listed in the Estimated Fee Summary, the Parties agree to meet and confer to reach agreement on a revised cost that will be shared as described in paragraph B below, so that the Work can be completed. Agreement on said revised cost shall not be binding on any Party unless and until that Party formalizes its agreement to the revised cost in writing to each of the other Parties.

B. **Costs to be shared.** The $68,679 cost to be shared is contained in the Estimated Fee Summary of Attachment 1. This cost will be shared in the following percentages:
Watermaster share = 0% ($0)
District share = 33 and 1/3% ($22,893)
CAWC share = 33 and 1/3% ($22,893)
M1W share = 33 and 1/3% ($22,893)

(In the event a revised cost is agreed to, as described in paragraph A above, these dollar figures will change).

As noted under the heading "Services Not Included" in Attachment 1, certain items are not included in the Consultant's scope of work or estimated costs. These items include:

- Laboratory fees
- Construction of site facilities
- Permit fees
- Cost of water, electricity, or other utilities, and
- Any other items not specifically included in the Consultant's scope of services.

The parties agree that the DISTRICT, CAWC, and M1W will each undertake and pay for these activities for their individual projects.

C. **Documents to be provided.** The DISTRICT will ensure that: (1) After completion of Tasks 1, 2, 3, 4, and 5, as described in Attachment 1, a Technical Memorandum or summary report will be prepared by the Consultant and provided by the DISTRICT to each of the other Parties, and (2) After completion of Task 6 an overall summary report will be prepared by the Consultant and provided by the DISTRICT to each of the other Parties.

D. **Payment of costs and reimbursement to the DISTRICT.** The DISTRICT will make progress payments to the Consultant as it satisfactorily performs the Work. After the satisfactory completion of the work, the DISTRICT will provide to CAWC and M1W copies of the invoices received from and payments made to the Consultant. Within 45 days of receiving those documents, CAWC and M1W will reimburse the DISTRICT for their respective shares of those costs.

E. **Term of Agreement.** The term of this Agreement shall commence on the date of its execution by all Parties, and shall continue in effect until the DISTRICT has been reimbursed as described in paragraph D above.

F. **Hold Harmless.** Under this Agreement the Parties do hereby agree to indemnify, defend, and hold the other Parties, their respective Board members, officers, employees, agents, and representatives harmless from and against any and all liability, claims, suits, actions, damages, and causes of action of any kind arising out of the indemnifying Party's use of the Work in the planning, design, and construction, operation, and maintenance of the indemnifying Party's projects.

G. **Venue**. This Agreement shall be governed by the laws of the state of California. The Parties agree that venue for any litigation arising out of this Agreement shall be exclusively vested in the state courts of the County of Monterey, or the United States District Court for the Northern District of California. Further, the prevailing Party shall be entitled to reasonable attorney fees and costs.

H. **Miscellaneous**. This Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall be deemed to constitute one and the same instrument. Paragraph headings are for convenience only and shall not be used in interpreting this Agreement. All Attachments to this Agreement are incorporated herein. This Agreement constitutes the entire agreement between the Parties with respect to the subject matter herein and may only be modified in a writing executed by all Parties. Each Party acknowledges that it participated in the drafting of this Agreement and agrees that any ambiguity herein shall not be construed against any Party as the drafter of the Agreement.

I. **Notices**. Written notice shall be deemed to have been duly served if delivered in person or by mail to the individuals and at the addresses listed below:

A. WATERMASTER: Technical Program Manager
Seaside Basin Watermaster
P.O. Box 51502
Pacific Grove, CA 93950

B. DISTRICT: General Manager
Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, CA 93940

C. CAWC: Operations Manager, Central Division
California American Water
511 Forest Lodge Road, Suite 100
Pacific Grove, CA 93950

D. M1W: General Manager
Monterey One Water
5 Harris Court, Building D
Monterey, CA 93940

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement as of the dates shown below.

WATERMASTER

Date: 2/10/18

By: _____
Ralph Rubio, Chair, Board of Directors

DISTRICT

Date: 2/12/18

By: _____
David Stoldt, General Manager

CAWC

Date: 2/7/18

By: _____
Eric Sabolsice, Director of Operations

MHW

Date: 2-14-18

By: _____
Paul Sciuto, General Manager

ATTACHMENT 1

Scope of Work and Cost

to

Perform Modeling of Proposed Groundwater Recharge Projects to Assess the Geochemical Interaction Effects of Introducing Non-native Water from Those Projects into the Native Water in the Basin

November 17, 2017
Project No. 12-0048

Monterey Peninsula Water Management District
5 Harris Court, Building G
Monterey, California 93942

Attention: Mr. Jonathan Lear, Senior Hydrogeologist

Subject: Proposal for Seaside Groundwater Basin Geochemical Interaction Evaluation

Dear Mr. Lear:

In accordance with your request, Pueblo Water Resources, Inc. (PWR) is pleased to submit this proposal to provide a geochemical interaction evaluation of various managed aquifer recharge (MAR) projects currently planned to be implemented in the Seaside Groundwater Basin (SGB). Presented in this proposal is a detailed scope of work, estimated costs, and schedule to provide the requested services.

PURPOSE AND SCOPE

The purpose of the proposed work is to perform an initial geochemical interaction modeling assessment of various active and proposed MAR projects in the SGB. The only currently active MAR project is the Monterey Peninsula ASR Project, which injects treated excess Carmel River System water into 4 existing ASR wells (ASR-1 through ASR-4). Proposed MAR projects include the Pure Water Monterey and Monterey Peninsula Water Supply Project (MPWSP), which would inject advanced treated recycled water and desalinated seawater, respectively, into future injection wells in the SGB. The proposed activities and programs related to MAR in the SGB will ultimately result in the mixing and interaction of the following 4 waters:

- Santa Margarita Sandstone aquifer native groundwater
- Treated and disinfected Carmel River System water
- Treated water from the Pure Water Monterey project
- Desalinated seawater from the MPWSP

All of these waters will mix together in various proportions at various times within the geologic matrix of the Santa Margarita Sandstone aquifer (Tsm) within the SGB. The intermixing of these 4 waters and their individual and combined reactions with the minerals in the Tsm formation will result in a variety of geochemical reactions – these reactions may be beneficial (e.g., stabilization of water quality and reduction in corrosivity) or potentially problematic (e.g., precipitation of cementitous scales or evolution of gasses) – and would alter the quality of the

water recovered from the ASR wells and California American Water's (CAW) other municipal production wells in the SGB.

It is therefore prudent to investigate these geochemical reactions and to identify the potential for adverse reactions; and if present, to identify measures to avoid such adverse conditions. The investigation proposed herein will address these issues through a stepwise approach as discussed below.

Scope of Services

The above scenarios can be analyzed through utilization of geochemical simulations from various interaction models and chemical equilibrium databases. A geochemical interaction model has been developed by PWR in recent years to address the interaction of the Tsm mineralogy with Carmel River System waters and Native Tsm groundwater to address these same issues, and will be expanded to cover the more complex interactions of the 4 proposed project waters. PWR's existing geochemical model is based on the USGS geochemical interaction software PHREEQC-2, version 2.15.2697 combined with the robust Lawrence Livermore National Laboratory (LLNL) geochemical equilibrium database.

Implementation of the investigation will include the following tasks, which are structured to allow assessment of results at each step and provide the opportunity to modify the investigation or drop specific lines of analysis due to either fatal flaws or findings of no potential significance. A brief overview of the proposed scope or work by task is presented below:

Task 1 – Water Chemistry Data Compilation

Characterize the complete composition and character of the 4 water sources via laboratory and field analyses, or in the case of waters that do not currently exist (ie MPWSP desal plant water and Pure Water Monterey project effluent), quantitative process modeling estimations of water quality parameters (note that these process modeling estimations are not part of our services and would be provided by the project proponent's engineers). The initial step in this effort will be the preparation of a list of water chemistry parameters necessary for geochemical interaction modeling and a request for data for the injection source waters from the Pure Water Monterey and MPWSP project sponsors (MRWPCA and CAW, respectively). Data gaps will be identified and a Sampling and Analysis Plan (SAP) will be developed to fill any data gaps.

Task Deliverable: A Technical Memorandum (TM) summarizing the available water quality data for each of the project sources, and a SAP to fill-in missing data. *Note that no costs for collection of field or laboratory data are budgeted in this task. If additional sampling is necessary, such costs are assumed to be the responsibility of the respective source water generators or project proponents.*

Task Duration: 4 weeks

Task 2 – Aquifer Mineralogy Data Compilation

Characterize the mineral composition of the Tsm aquifer via empirical laboratory analysis of well cuttings and/or core samples. These data already exist for two of the ASR project wells (ASR-2 and ASR-3) that characterize the Tsm aquifer mineralogy at the two ASR facilities (Santa Margarita and Seaside Middle School, respectively); however, similar data will be needed for the Pure Water Monterey and MPWSP well facilities, and will need to be coordinated with the construction of the new wells for these projects. In addition, the older/existing mineralogical data may be incomplete for purposes of this new modeling effort. To maximize the quality and quantity of data available for this work, detailed protocols for sample collection and analytical testing will be provided.

Task Deliverable: A TM summarizing the mineral characterization of the Tsm, and protocol for the sample collection and analysis of upcoming Tsm mineralogy samples. *Note that no costs for field or laboratory analyses are budgeted for this task; but are reportedly included in the current budgets for the construction of the monitoring well for the Pure Water Monterey project in May 2018.*

Task Duration: 2 weeks

Task 3 – Geochemical Model Development

Develop a geochemical interaction model based on the data derived from Tasks 1 and 2 above, combined with the geochemical equilibrium databases discussed previously.

To complete this work, the existing model will be upgraded and expanded, including the addition of the most recent French Geological Survey (BRGM) Thermoddem V1.1 database and the Swiss (ETH Zurich) CHEMDATA17 database. The upgrades will allow further analysis of water quality stabilization, more accurate identification of sulfate/carbonate/siliceous scaling, and assessment of corrosivity issues in recovered waters.

Task Deliverable: A summary of model base and primary settings will be provided if requested.

Task Duration: 3 weeks

Task 4 – Model Mixing Ratios

Upon completion of Task 3, PWR will model a number of mixing ratios of the four water types. For the purpose of planning, there will be 21 mixtures of various percentage mixtures of the four water types; **Table 1** outlines the mixing ratios that will initially be modeled. The matrix of water mixtures presented in **Table 1** were chosen through discussions with MPWMD staff to bracket the potential extreme case mixing scenarios that might occur during program operations; this methodology should identify potential problem areas to avoid early in the investigation, which will allow additional efforts to analyze these scenarios if warranted.

PWR will analyze the geochemical stability of each of the individual waters, and perform the modeling of the proposed intermixing scenarios described above. The results of the

modeling will be analyzed and interpreted with specific attention to potentially adverse geochemical interactions such as mineral scale formation, gas evolution, and leaching/mobilization of deleterious compounds within the Tsm formation.

Task Deliverable: A TM summarizing the results of the geochemical interaction modeling, and recommendations for additional model scenarios based on the initial output runs.

Task Duration: 6 weeks

Table 1. Summary of Mix Ratios for Geochemical Modeling

Mix No.	% Native Tsm Water	% Treated Carmel River Water	% Reclaimed PWM Water	% Desal Water
1	100	0	0	0
2	0	100	0	0
3	0	0	100	0
4	0	0	0	100
5	66	33	0	0
6	66	0	33	0
7	66	0	0	33
8	33	66	0	0
9	0	66	33	0
10	0	66	0	33
11	33	0	66	0
12	0	33	66	0
13	0	0	66	33
14	33	0	0	66
15	0	33	0	66
16	0	0	33	66
17	55	15	15	15
18	15	55	15	15
19	15	15	55	15
20	15	15	15	55
21	25	25	25	25

Task 5 – (Optional Task) Additional Focused Analysis

Based on the results of Task 4 above, PWR will identify those mixture simulations that show undesirable geochemical reactions (ie mineral precipitation or gas evolution) and will re-run those model simulations under various modifications of mix ratios and/or aquifer conditions

to identify methods of mitigating the observed adverse reactions and to identify potential operational scenarios which would prevent such adverse geochemical reactions from occurring.

Task Deliverable: A TM summarizing the results of the supplemental modeling and recommendations for project design and/or operational changes associated with enhancing recovered water quality or avoiding adverse geochemical reactions.

Task Duration: 4-6 weeks

Task 6 – Reporting

Upon the conclusion of tasks 1-5, PWR will develop an overall summary report and recommendations for process and/or operational changes for each project to reduce or avoid adverse geochemical reactions. PWR will also participate in two technical workshops with project stakeholders to discuss the impacts to the various regional projects, and participate in one presentation to the Watermaster Board to address questions and present findings.

Task Duration: 4 weeks

Task 7 – Project Management and Meetings

Provide routine project management, including invoicing, schedule management, project coordination and communication. This will include one intermediate and one final presentation of the evaluation findings and recommendations to the SGB Water Master Technical Advisory Committee (TAC).

Task Duration: Ongoing

Services Not Included

It should be noted that completion of this project will require services which are not included in our proposal; the costs for these items are presumed to be paid for by the project proponents under the provisions of the Storage Agreement. These items include (but are not limited to) the following:

- Laboratory fees;
- Construction of site facilities;
- Permit fees;
- Cost of water, electricity, or other utilities;
- Any other items not specifically included in PWR's scope of services.

ESTIMATED FEES AND SCHEDULE

Based on the scope of services presented herein, we estimate the fees for our services will be approximately *$51,365*, which will be billed on a time-plus-expenses basis in accordance with our current Fee Schedule (attached). An estimated fee summary worksheet is attached summarizing the estimated man-hours and costs per task/work item. The spreadsheet also identifies the cost total including Optional Task 5, as well as a 10 percent contingency which has been noted in the attached budget summary in the event that unforeseen project complications or constraints arise (total with optional task and 10% contingency is *$68,679*). We recommend the contingency be held for authorization by District staff upon written justification by PWR.

We understand that in order to authorize this work, your Board must first approve a formal contract amendment. Based on our current workload, we believe that we can commence work within two weeks of your authorization and that the work will be completed within approximately 4 months.

We appreciate the opportunity to provide ongoing assistance to the District on this important community water-supply project. If you require additional information regarding this or other matters, please contact me.

Sincerely,

PUEBLO WATER RESOURCES, INC.

Stephen P. Tanner, P.E.
Principal Engineer

SPT.rcm

Attachments: Cost Estimation Spreadsheet
2018 Fee Schedule

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

Professional Services for SGB Geochemical Interaction Evaluation

PUEBLO water resources

PWR Project No.: 12-0048

ESTIMATED FEE SUMMARY

LABOR		Principal Professional	Senior Professional	Drafting	WP	Hours by Task	Estimated Task Cost
	Hourly Fee	$205	$185	$115	$95		
Task No.	Task Description						
1	Water Chemistry Data Compilation	22	-	-	12	34	$5,650
2	Aquifer Mineralogy Compilation	38	-	-	-	38	$7,790
3	Geochemical Model Development	48	-	-	-	48	$9,840
4	Model Mixing Ratios	67	-	-	-	67	$13,735
5	Additional Focused Analysis (OPTIONAL)	54	-	-	-	54	$11,070
6	Reporting	48	-	-	-	48	$9,840
7	PM and Meetings	22	-	-	-	22	$4,510
		-	-	-	-	0	$0
		-	-	-	-	0	$0
		-	-	-	-	0	$0
	Hours by Labor Category:	299	0	0	12		
	Costs by Labor Category:	$61,295	$0	$0	$1,140		

Total Labor Hours (not inc. Optional Task):	257
Total Labor Costs (not inc. Optional Task):	$51,365
Total Labor Hours (inc. Optional Task):	311
Total Labor Costs (inc. Optional Task):	$62,435

OTHER DIRECT COSTS (ODC's) Item	Units	Unit Price	No. of Units	Fee
Vehicle	Daily	$75		$0
Travel Per Diem	Daily	$150		$0
				$0
				$0
				$0
			Subtotal ODCs:	$0

OUTSIDE SERVICES Task No.	Item	Units	Unit Price	No. of Units	Fee
					$0
					$0
					$0
					$0
					$0
Subtotal Outside Services:					$0
Subtotal Outside Services w/ Markup (15%):					$0

COST SUMMARY	
Labor (not inc. Optional Task)	$51,365
Other Direct Costs	$0
Outside Services	$0
Subtotal (not inc. Optional Task):	$51,365
10 % Contingency (not inc. Optional Task)	$5,137
TOTAL ESTIMATED PROJECT COST (not inc. Optional Task):	$56,502
Task 5 (Optional)	$11,070
Subtotal (inc. Optional Task):	$62,435
10 % Contingency (inc. Optional Task)	$6,244
TOTAL ESTIMATED PROJECT COST (inc. Optional Task):	$68,679

PUEBLO WATER RESOURCES, INC
2018 FEE SCHEDULE

Professional Services

Principal Professional	$205/hr
Senior Professional	$190/hr
Project Professional	$175/hr
Staff Professional	$145/hr
Technician	$135/hr
Illustrator	$120/hr
Word Processing	$100/hr

Other Direct Charges

Subcontracted Services	Cost Plus 15%
Outside Reproduction	Cost Plus 15%
Travel Expenses	Cost Plus 15%
Per Diem*	$150/day
Vehicle	$75/day

Equipment Charges

Drilling Fluid Test Kit	$100/day, $400/week
Field Water Quality Meter (Hach DR890)	$75/day, $275/week
Orion ORP/pH/Temp Probe	$75/day, $275/week
Water Level Probes (In-Situ Mini-Troll/Level Troll)	$100/day, $300/week
Fuji Ultrasonic Flowmeter	$200/day, $750/week

*Regionally and seasonally specific to project.

PUEBLO WATER RESOURCES, INC • 4478 Market Street, Suite 705 • Ventura, CA 93003
805.644.0470 • 805.644.0480 FAX

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	7
AGENDA TITLE:	Information from AquaTronic Solutions Regarding Technology for Locating the Seawater Intrusion Interface Offshore in Monterey Bay
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

At the August 15, 2018 TAC meeting information was provided to the TAC regarding a presentation made at a Salinas Valley Basin Groundwater Sustainability Agency meeting on technology they are considering using in conjunction with development of their Groundwater Sustainability Plans. I attended that meeting and spoke briefly with Mr. John McKendry of AquaTronic Solutions, who made the presentation. He mentioned that they have done some offshore work to help other entities determine the locations and depths of aquifers.

At that TAC meeting there was consensus to look into the feasibility of using this technology to try to determine the approximate location in Monterey Bay of the seawater intrusion front for the Seaside Basin aquifers. I contacted Mr. John McKendry and asked him if the technology his firm employs would be able to do this, and if so how the work would be undertaken and how much it would cost.

Mr. McKendry provided the attached information that describes the equipment they would use for this work, and the attached draft proposal outlining how they would do the work.

Due to the extremely high cost of performing the work that Mr. McKendry proposes, I cannot recommend pursuing this work. However, if the TAC feels this is worth pursuing, I will try to arrange to have Mr. McKendry come to a future TAC meeting and make a presentation and answer questions from the TAC.

ATTACHMENTS:	Information from AquaTronics Solutions
RECOMMENDED ACTION:	Provide direction to the Technical Program Manager regarding further pursuing this work

HMS-620 Bubble Gun™

Ultra-Portable Low-Frequency Acoustic Seismic Systems

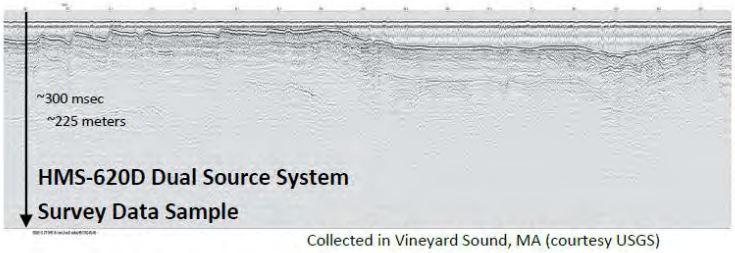
The HMS-620 Bubble Gun™ uses low-frequency acoustic signals to provide superior signal penetration vertically through coarse sand, gravel tills, and other difficult-to-penetrate sediments.

Small system component size and portability make this a valuable tool for any survey platform.

Complete Single-Source Bubble Gun™ System shown with source vehicle suspended on display frame and shipping case for transceiver and cables

APPLICATIONS

- Offshore Wind Turbine and Dam Site Surveys
- Cross River Surveys for Bridge Construction
- Bedrock Investigation
- Pipeline Construction Surveys
- Geotechnical Site Investigation
- Coastal Engineering



Collected in Vineyard Sound, MA (courtesy USGS)

FEATURES/BENEFITS

- **Wide-band 70-1700Hz pulse** provides bottom penetration through many sediment types
- **Very stable and repeatable source pulse without the need for external timing controllers**
- Rugged, lightweight transducer platform provides stable operation in adverse sea-state conditions
  - Electromagnetic Sound Source; **Contained Air Volume (no air compressor needed)**
  - Single and Dual Source Vehicles Available
  - No need for heavy handling or deployment equipment
- Flexible portable transceiver unit optimizes system for a wide range of sediments
  - Low-noise pre-amp with high/low pass filters and gain control
  - User-selectable trigger or external trigger
  - **Multiple Sources can be synchronized to a common trigger without need for external timing control**
  - **Repeatable Shot-to-Shot Phase and Amplitude Wavelet Correlation > 0.96**
- **Minimal Electric Power Requirements**
  - Selectable 110 or 220 VAC source of less than 1 KWatt for single source, or less than 2 KWatt for Dual Source
- Oil-filled single channel hydrophone streamer cable
  - 7-meter multi-element active section
  - 35-meter deactivation switches on each hydrophone element enable exportation outside of USA
- Compatible with industry-standard data acquisition software & multi-channel streamers

HMS-620D with Geometrics Geode and MicroEel multi-channel data acquisition system (courtesy Geometrics)

SPECIFICATIONS

HMS-620 Bubble Gun™ System Components

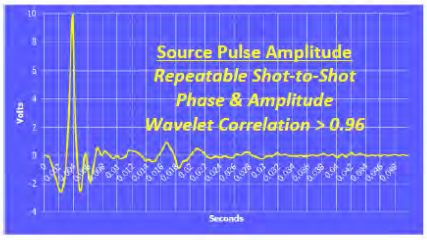
Source Vehicle and Electromechanical Tow Cable

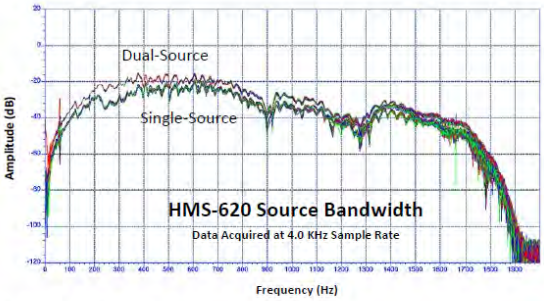
Source Type:	Electromagnetic / Contained Air Volume (no compressor needed)
Frequency:	Wide band, 70-1700Hz pulse
Acoustic Source Level:	Single: Approximately +200 dB ref 1μPa @ 1 meter Dual: Approximately +204 dB
Normalized Shot-to-Shot Cross Correlation:	Repeatable Shot-to-Shot Phase and Amplitude Wavelet Correlation > 0.96
Tow Vehicle:	Stainless steel and plastic frame, buoyant surface-towed vehicle
Tow Cable:	50-meter abrasion resistant electro-mechanical cable
Dimensions (approximate):	Single: 109.22 x 93.97 x 48.26 cm (43 x 37 x 26 in) Dual: 190.5 x 93.97 x 48.26 cm (75 x 37 x 26 in)
Weight in Air (approximate):	Single Vehicle/Source – 43.5 kg (96 lbs) Dual Vehicle/Source – 80 kg (175 lbs) Tow Cable - 12.25 kg (27 lbs)

Source vehicle is compact and easy to deploy

Seismic Transceiver

Signal Input:	Designed to operate with HMS-620 System Hydrophone Streamer Cable; 7-pin Amphenol connector
Gain:	Adjustable in 3 dB steps 0 to 45 dB
Filters:	Adjustable high- and low-pass active
Analog Interface:	± 10 V Output





Power Supply

Trigger Input:	External key or manual time-based selection
Repetition Rate:	1/8 second maximum
Transducer Connector:	7-pin Amphenol to mate with HMS-620 Source Vehicle Tow cable
Packaging:	Portable splash-resistant case
Dimensions & Weight:	55.88 cm x 53.34 cm x 25.4 cm (22 in x 21 in x 10 in); 17.24 kg (38 lbs)

Hydrophone Streamer Cable

Length:	Active section - 7 meters; Single- channel, 24 elements; Leader – 50 meters
Preamplifier:	Integral preamp - 20 dB gain; Designed to operate with HMS-620 Transceiver
Power Input:	Supplied by transceiver
Weight in Air:	13.6 kg (30 lbs)

Specifications Subject to Change without Notice

03 Feb 2016

Falmouth Scientific, Inc.
1400 Route 28A, PO Box 315, Cataumet, MA 02534-0315
Email: fsi@falmouth.com • Tel: 508-564-7640 • Fax: 508-564-7643 • www.falmouth.com

Proposal from AquaTronic Solutions (ATS)

Overview.

This project involves looking at the multiple aquifers under a selected area of Monterey Bay using the ATS electro-seismic technology.

The focus is to better understand the aquifer systems with particular focus on understanding the fresh water verse saline water interface, but, also an understanding of the hydraulic conductivity within these aquifers.

Survey Recommendation:

We have provided 2 survey line recommendations for consideration.

1) Red line.
    a. This is a 2-line beach front type survey. We have extended it past the Mulligan Hill monitoring well, but mainly with an interest in getting over the Moss Landing canyon area. I realise that the extension may be well outside of your demised area but that information may lead us to where the intrusion is starting.
    b. Line length = 32 miles.
2) Green line.
    a. This is a 3-line survey that extends further out into the bay.
    b. Line length = 45 miles.

Comments:

The reason we have included the green line is to allow the data that we present to be in 3D format.
If you decided to shoot just the green line you would only get 2D data back as there is simply not enough surface area.

We highly recommend you give consideration to undertaking both lines as you will get a great deal more information.

I also believe if both lines are shot at the same time then less overall points will be required – meaning we may be able to acquire the data using less data points (effectively widening the points from 50m to 100m locations) as with 3D we get a much better view and understanding of what is happening.

Permitting.

ATS do not get involved in any local permitting requirements. That is all the responsibility of the client.

“Seismic”.

As soon as the word “seismic” is used people become anxious. It is most important that the difference in the ATS technology and traditional acoustic seismic operations are demonstrated to all parties. The ATS “electro-seismic” environmental foot print is very small and unobtrusive in comparison to traditional acoustic seismic. We do not have large compressed air airguns. We use a system that is effectively a base speaker. It delivers 2 sound files at each location and then we simply pull forward and go again. The surface area required for our equipment is 8 square feet and we certainly do not tow large arrays of antenna.

The image below is showing the equipment that is used in the water and that is it in full.

Vessel.
The vessel we would use would look something like the image below. It would be hired locally. Equipment onboard would simply be 2 clean air generators.

Proposed survey lines.
The next image demonstrates the proposed survey lines. The minimum we could do is the red lines but please give serious consideration to both.

Costing estimate:
This costing estimate has been put together to allow you to understand what the costs associated with a survey are, and, to assist you in making your value-based decisions.

Costing Overview:

Red line.

Distance:

Miles	Kilometres	Points x 50m/164ft spacings.
32miles	52km	1040

Green line.

Miles	Kilometres	Points x 50m/164ft spacings.
45	73	1460

Combined red and green lines 3D.

Miles	Kilometres	Points x 50m	A) Points x 100m
77	125	2500	1250
			B) Points x 150m
			834.

Costings:

The ATS charge model works on three cost centres:

1) Data processing.
    a. This works on a depth of survey x per point basis. This allows the clients to select the depth they wish to look to.
    b. When the depth is selected, it costs $1.00 USD + tax per metre of depth per point to have the data processed. This includes preparation of a 100 + page report and includes 2D and 3D models.
    c. This also includes exporting the processed data into other formats and platforms requested by the client.
    d. **NB**: All raw field data is digitally exported to South Africa and is processed inside our data processing center there then emailed back to the client.
2) Data acquisition.
    a. This covers all costs associated with acquiring the electro-seismic data.
    b. Flights, hotels, staffing, rig/vessel hire, bubble gun hire, insurance, safety officers, data, GPS etc.
3) Mobilisation.
    a. This includes getting the equipment to the survey site, loaded and set up on the vessel, unloaded, packing down and then packing up and resending to base.

Data acquisition program estimation (weather dependant).

- It is estimated that between 60 and 80 individual points will be completed each day.
- ATS would lock into a maximum day allocation and if that ran over no costs to the client.
    - Red line 18 days.
    - Green line 24 days.
    - Combined red and green lines (3D)
        - 100m 21 days, (A) or
        - 150m 14 days (B)

Costs:

Day hires:

Vessel.	Usually paying (includes captain)	$5000 per day.

Bubble gun.	Hire	$4800 per day.
Staff.	2 x ATS staff ($1100 per day each)	$2200 per day.
Safety.	1 officer ($700 per day)	$ 700 per day.
Shore vehicle.		$ 100 per day.
Off days.	Weather	TBC.

Project hires:

Airfares .	5 x NZ – USA flights.	$20,000.
Hotels.	4 rooms x say 20 nights x $125	$10,000.
Insurance.		$35,000.
Permitting.		$0 client.

Project costing estimate (See table below):

Comments.

- The above figure estimates are calculated in USD and have been run on mapping both the Paso Robles and to the base of the Santa Margarita aquifers. If you are concerned we are not looking deep enough then we simply extend the depth/cost.
- This document has been prepared to allow you to understand the costs involved with running a survey.
- All ATS contracts are completed on 1/3 1/3 1/3 basis. First third is payable upon acceptance. Second due upon data acquisition completion and the third is due prior to full report delivery.
- Timing. If there is interest, then let's discuss.
- ATS would outsource the data acquisition to one of our local contractors but the project would be overseen by myself.
- Results. These would take 21 working days to prepare. Delivery of results would be via a Goto meeting presentation held by Dr Michael du Preez and transmitting from our data processing center in South Africa. I would hopefully attend that meeting in person in Monterey CA.
- I have attached a 3D PDF onshore model and some relevant slides.

Bob, I am heading your way in week 1 November to finalise several other projects so we could meet there if the above is of any interest to you. I do believe you will get a great deal of information from the survey. Maybe an onshore shoreline survey line would assist you as well ?

Thank you for the opportunity and I look forward to hearing from you.

Kind regards

John R McKendry
Managing Director
Aquatronic Solutions International
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5 Charles Street, Riverdale, Gisborne, New Zealand 4010.
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Skype: johnMcKendry1

Line name	Days Estimate	No of points.	Aquifer Paso Robles 600ft/182m	Aquifer Santa Margarita. 1500ft / 460m	Data acquisition (say $18,000 per day)	Mobilisation. Freight/Customs clearance. Say $30,000.	**Total on Santa Margarita Aquifer depth of 460M**
Red	18 + 2	1040	$189,280.00	$478,400.00.	$360,000.00	$30,000.00	**$868,000.00**
Green	24 + 2	1460	$265,750.00	$671,600.00	$468,000.00	$30,000.00	**$1,169,600.00**
Combined A	21 + 2	1250	$227,500.00	$575,000.00	$414,000.00	$30,000.00	**$1,019,000.00**
Combined B	14 + 2	830	$151,060.00	$381,800.00	$288,000.00	$30,000.00	**$562,860.00**

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	8
AGENDA TITLE:	Set Next Meeting Date
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

The Preliminary Draft of the Updated Basin Management Action Plan, originally intended to be on today's Agenda for discussion, was still being completed at the time of preparation of this Agenda packet. Therefore, it will be necessary to have a TAC meeting in December in order for that item to be presented. It needs the TAC's review before it can go to the Board at its January 2, 2019 meeting.

Therefore, the next TAC meeting will be held on Wednesday December 12, 2018.

ATTACHMENTS:	None
RECOMMENDED ACTION:	Approve holding the next TAC meeting on December 12, 2018

SEASIDE BASIN WATER MASTER
TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	9
AGENDA TITLE:	Schedule
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:

As a regular part of each monthly TAC meeting, I will provide the TAC with an updated Schedule of the activities being performed by the Watermaster, its consultants, and the public entity, MPWMD, which is performing certain portions of the work.

Attached is the most recent update of the Work Schedule for FY 2018.

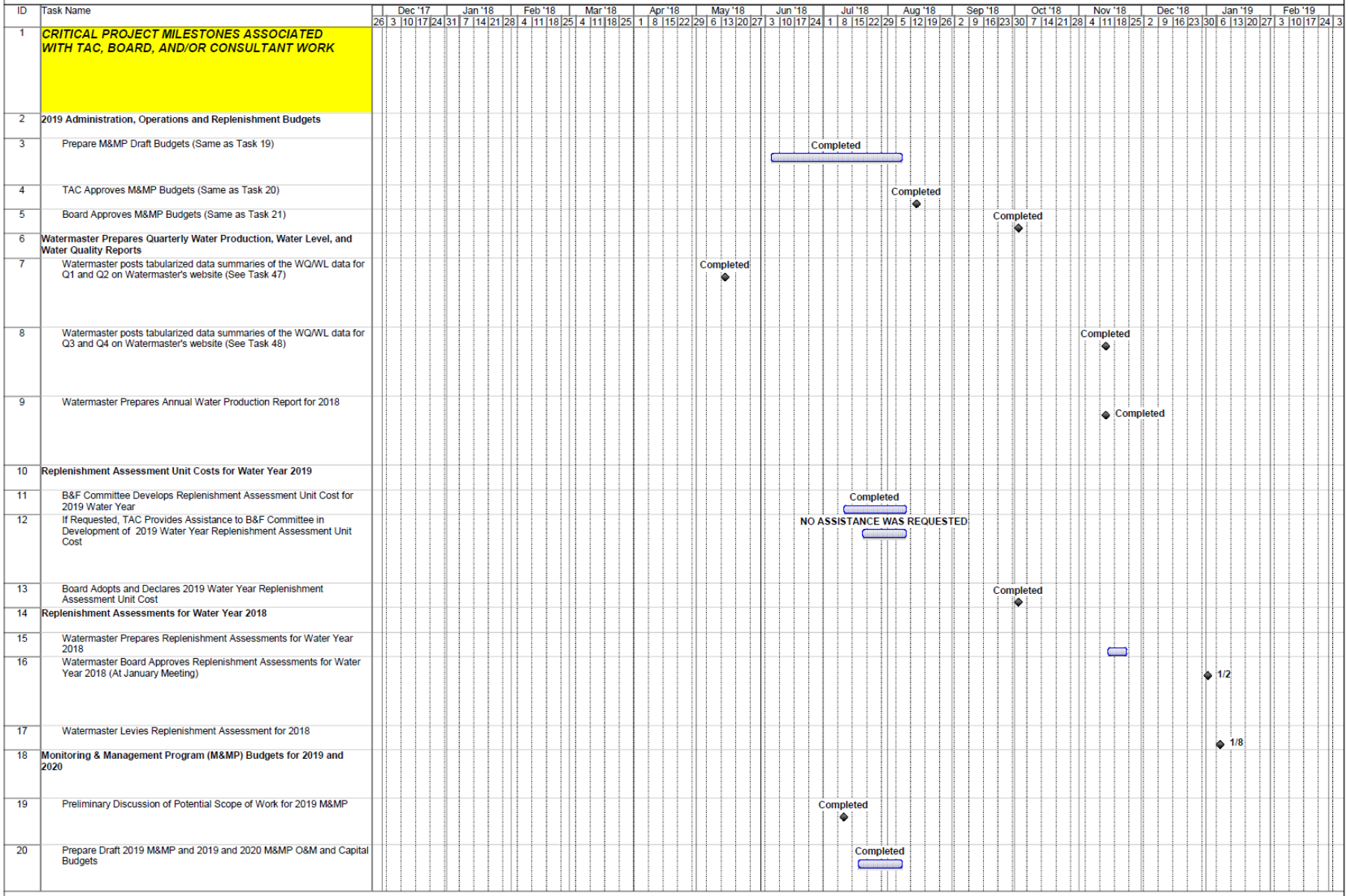
There are a few things to note in this update:

1. As there will still be TAC business that needs to be conducted, there will need to be a December 2018 TAC meeting.
2. The Board has canceled its normal December 5 meeting and will hold its next meeting on January 2, 2019 to approve a number of things including the Annual Report and the Initial Consultant Contracts for 2019.

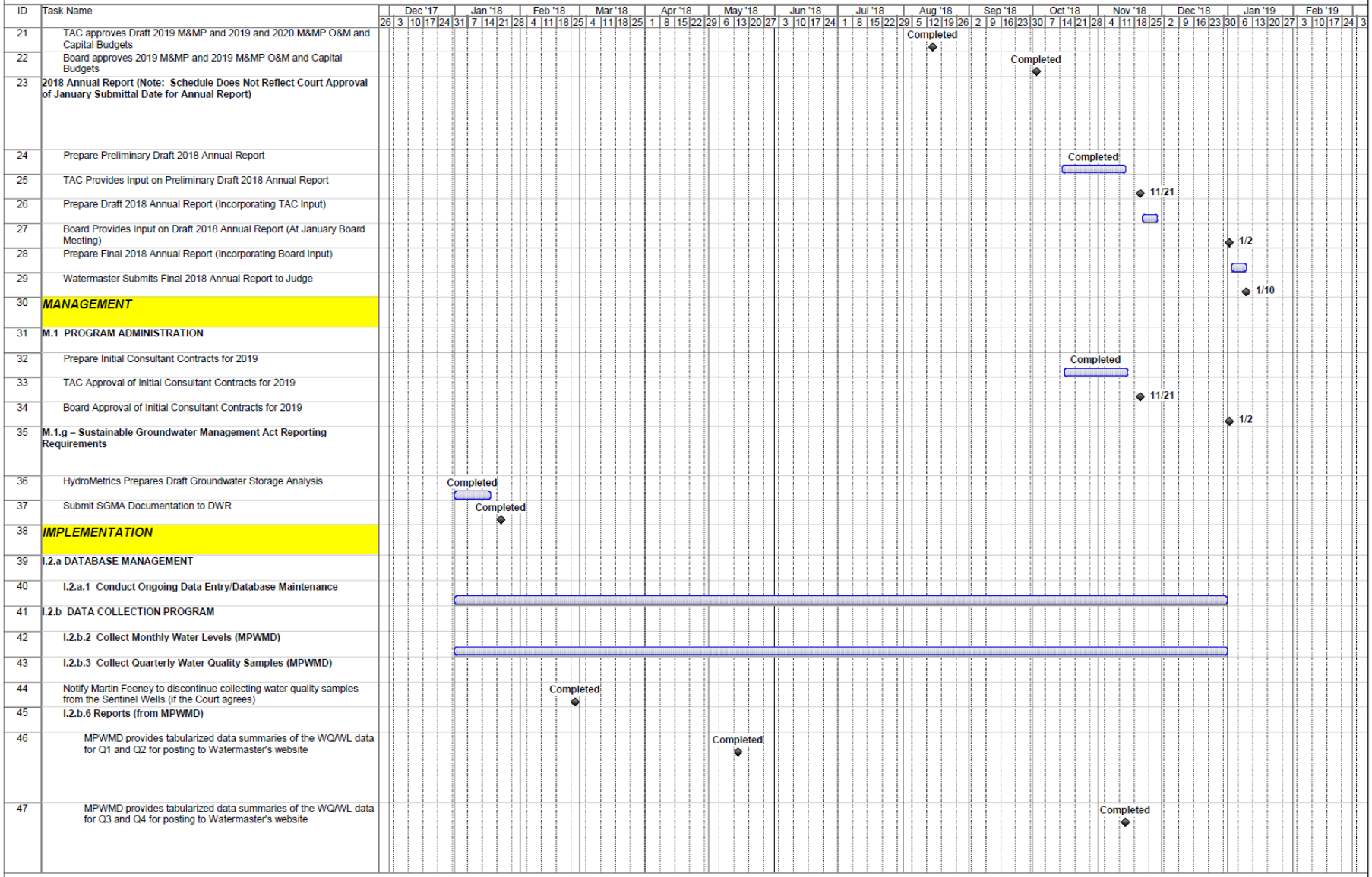
The January TAC meeting agenda will contain the proposed Work Schedule for FY 2019.

ATTACHMENTS:	Schedule of Work Activities for FY 2018
RECOMMENDED ACTION:	Provide Input to Technical Program Manager Regarding Any Corrections or Additions to the Schedule

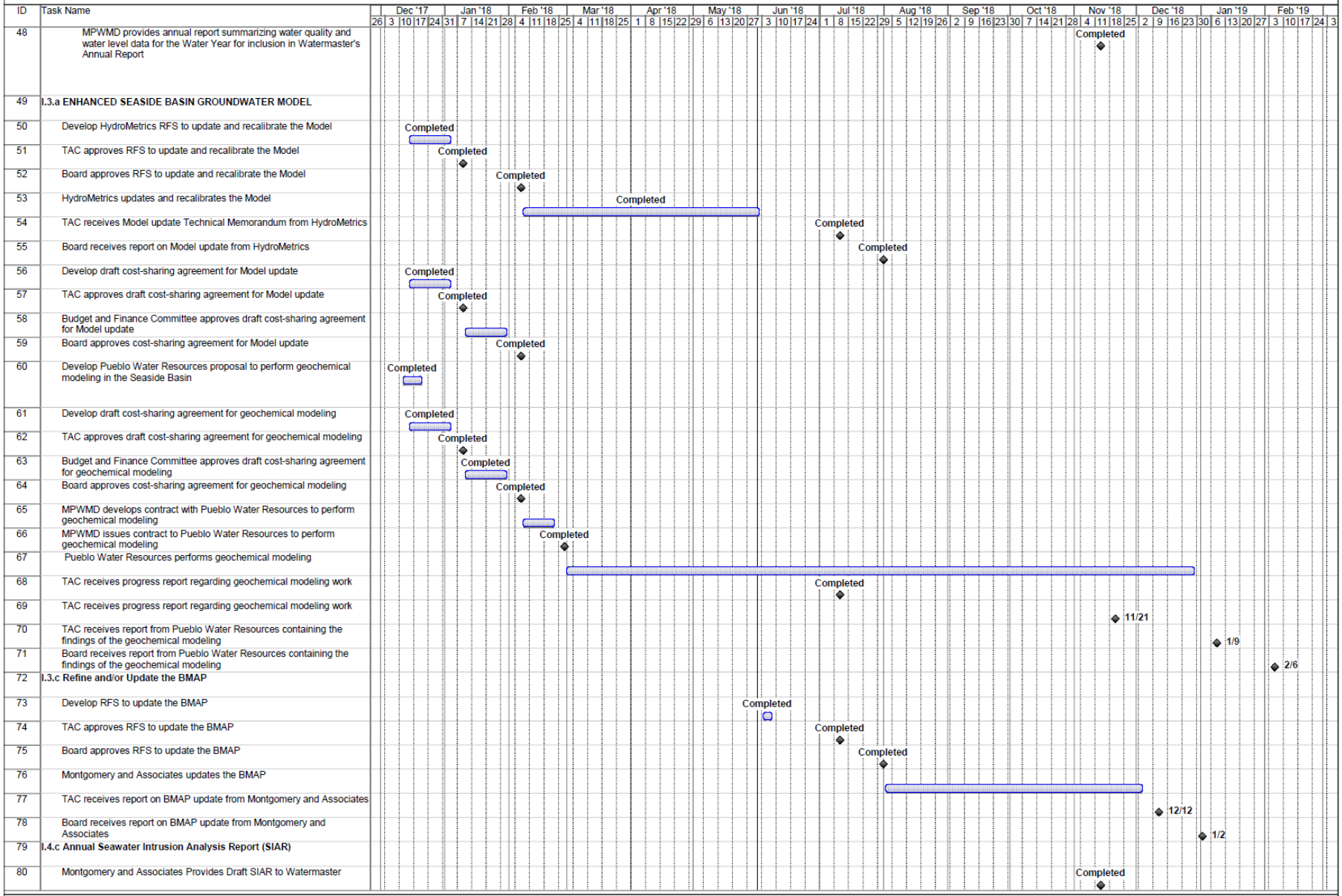
Seaside Basin Watermaster
Monitoring and Management Program
2018 Work Schedule



Seaside Basin Watermaster
Monitoring and Management Program
2018 Work Schedule

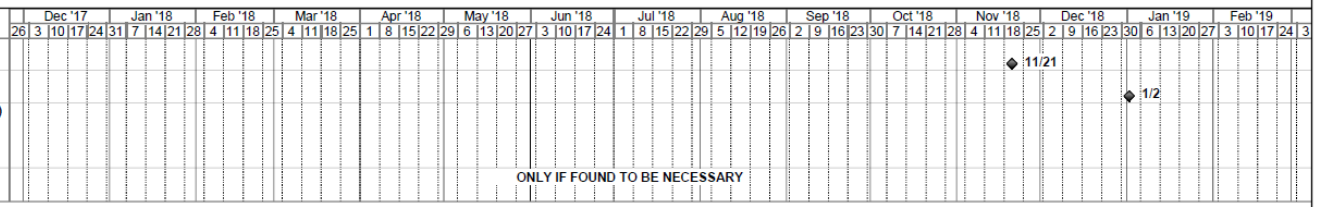


Seaside Basin Watermaster
Monitoring and Management Program
2018 Work Schedule



Seaside Basin Watermaster
Monitoring and Management Program
2018 Work Schedule

ID	Task Name
81	TAC Approves Annual Seawater Intrusion Analysis Report (SIAR)
82	Board Approves Annual Seawater Intrusion Analysis Report (SIAR)
83	**I.4.d Complete Preparation of Seawater Intrusion Response Plan (SIRP)**
84	**I.4.e Refine and/or Update the SIRP**



SEASIDE BASIN WATER MASTER TECHNICAL ADVISORY COMMITTEE

** * * AGENDA TRANSMITTAL FORM * * **

MEETING DATE:	November 21, 2018
AGENDA ITEM:	10
AGENDA TITLE:	Other Business
PREPARED BY:	Robert Jaques, Technical Program Manager

SUMMARY:
The "Other Business" agenda item is intended to provide an opportunity for TAC members or others present at the meeting to discuss items not on the agenda that may be of interest to the TAC.

ATTACHMENTS:	None
RECOMMENDED ACTION:	None required – information only