ANTELOPE VALLEY SALT/NUTRIENT MANAGEMENT PLAN
STAKEHOLDER MEETING MINUTES
November 20, 2013
Location: Palmdale City Hall, Lilac Room
11:00 a.m. – 12:00 p.m.

Attendees: Tom Barnes (AVEK), Tim Chen (LACWD), Dwayne Chisam (AVEK), Wanda Deal (EAFB), Erika de Hollan (LACSD), Brian Dietrick (RMC), Dawn Flores (RMC), Virginia Fowler (LACFCD), Dan Gillette (US Borax), Susan Haseltine (EAFB), Aracely Jaramillo (LACWD), Bob Large (Lake Town Council), Yvonne Malikowski (Lake LA Park Association), Brenda Ponton (RMC), Jose Saez (LACSD Consultant), Brach Smith (RCSD), Carlyle Workman (Lancaster)

RWQCB/DWR Updates

No updates from agency representatives. However, Jan Zimmerman provided LACWD with a sample anti-degradation analysis via e-mail. It was reiterated that the Lahontan Regional Board is consulting with their counsel to determine whether CEQA will be required for the Regional Board's acceptance of the SNMP. The Regional Board will provide an update after counsel has made its determination.

Salt Balance Update

Handouts showing numerical assumptions, discussion bullet points, and diagrams were provided in the meeting. The first diagram (Attachment A) shows the water/constituent sources directly loading and unloading the groundwater basin. Sources include return flows, natural recharge and aquifer recharge projects for basin loading and groundwater extraction for basin unloading. The second diagram (Attachment B) is a more comprehensive flowchart illustrating the constituent balance. It shows water sources for M&I and agricultural uses and associated return flows, source for and use of recycled water, septic systems with flow from indoor M&I use as source and resulting return flow, aquifer recharge with imported/surface water and potentially from recycled water, and natural recharge.

The various sources that contribute to the salt and nutrient loading of the groundwater basin are distinguished in the salt balance model. Each source impacts the groundwater differently as each has distinct salt and nutrient concentration levels and distinct proportions of water reaching the aquifer. Natural recharge typically has low levels of salts/nutrients whereas return flows may have more salts/nutrients.

Attachment C lists broad assumptions for the current salt balance and was provided for discussion purposes. The information and diagrams will be revised based on discussions from this meeting and subsequent comments from stakeholders.

There was confusion with the use of the word "surface water." On Attachment B, "surface water" is precipitation runoff used by LCID and PWD for M&I, agriculture, and aquifer recharge projects. In Attachment C, "surface water" refers to the imported State

Water Project water used by AVEK, LCID and PWD. As mentioned by Wanda, the Attachment B diagram does not show precipitation runoff/"surface water" flowing to Piute Ponds/Rosamond Dry Lake. Both diagrams will be revised to have "imported water" represent surface water used by AVEK, LCID and PWD.

The simplified salt balance model projects TDS concentration for the entire regional principal aquifer and assumes instantaneous mixing. To be consistent with the AV IRWMP, the model assumes total sustainable yield of 110,000 AFY. All numerical assumptions are listed on the Notes & Assumptions handout, including the conservative assumption of 100% salts reaching the aquifer. Additional analysis on a sub-basin level may be required in the future. Any component related to the salt balance model can be revised or added if more accurate and applicable information becomes available in the future. This includes a naturally occurring "straw piping system" in Rosamond Dry Lake, which was introduced in case any relevant information becomes available in the future.

Monitoring Locations

A map handout with 33 new monitoring locations (Attachment D) was provided at the meeting. The map also shows current and future project site locations (includes infrastructure and recycled water treatment plants). The well sites and projects are assigned letters and numbers, respectively, for identification.

The monitoring locations are water supply wells and were selected based on proximity to project sites and urban locations. The previously chosen locations needed to be revised because most of those wells were not found in the State Water Board GeoTracker GAMA website. In order to monitor future salt and nutrient levels using the website, per the Regional Board's preference, the new locations were selected from a list generated by GAMA. Only select water supply wells are found on GAMA.

The Lancaster sub-basin is suitably represented with 25 monitoring locations. Neenach sub-basin has two locations and Buttes and Pearland sub-basins have three locations each.

Of the potential monitoring wells, 23 are owned and operated by established water utilities or US Air Force. The remaining wells belong to mutual water companies, industrial companies and some smaller entities (hospital, elementary, casino).

Two wells used by Rosamond CSD ("C") and Land Project Mutual Water Company ("J") were discussed and found to be abandoned/inactive and no longer in use. These wells will not be used for monitoring.

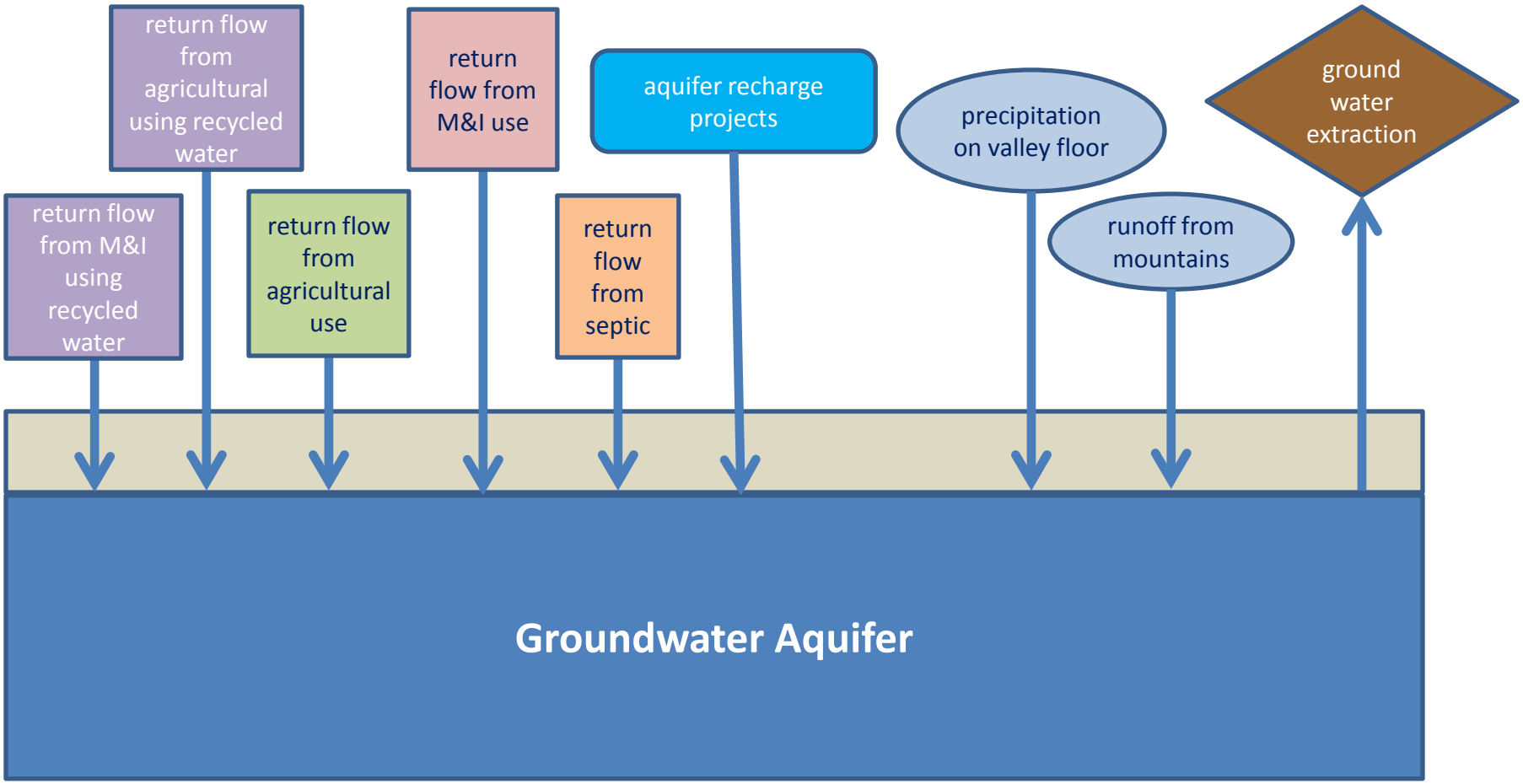
Next Meeting

The next stakeholder meeting is scheduled for Thursday, January 16, 2014 at 10:30 am in Lancaster City Hall.

ATTACHMENT A

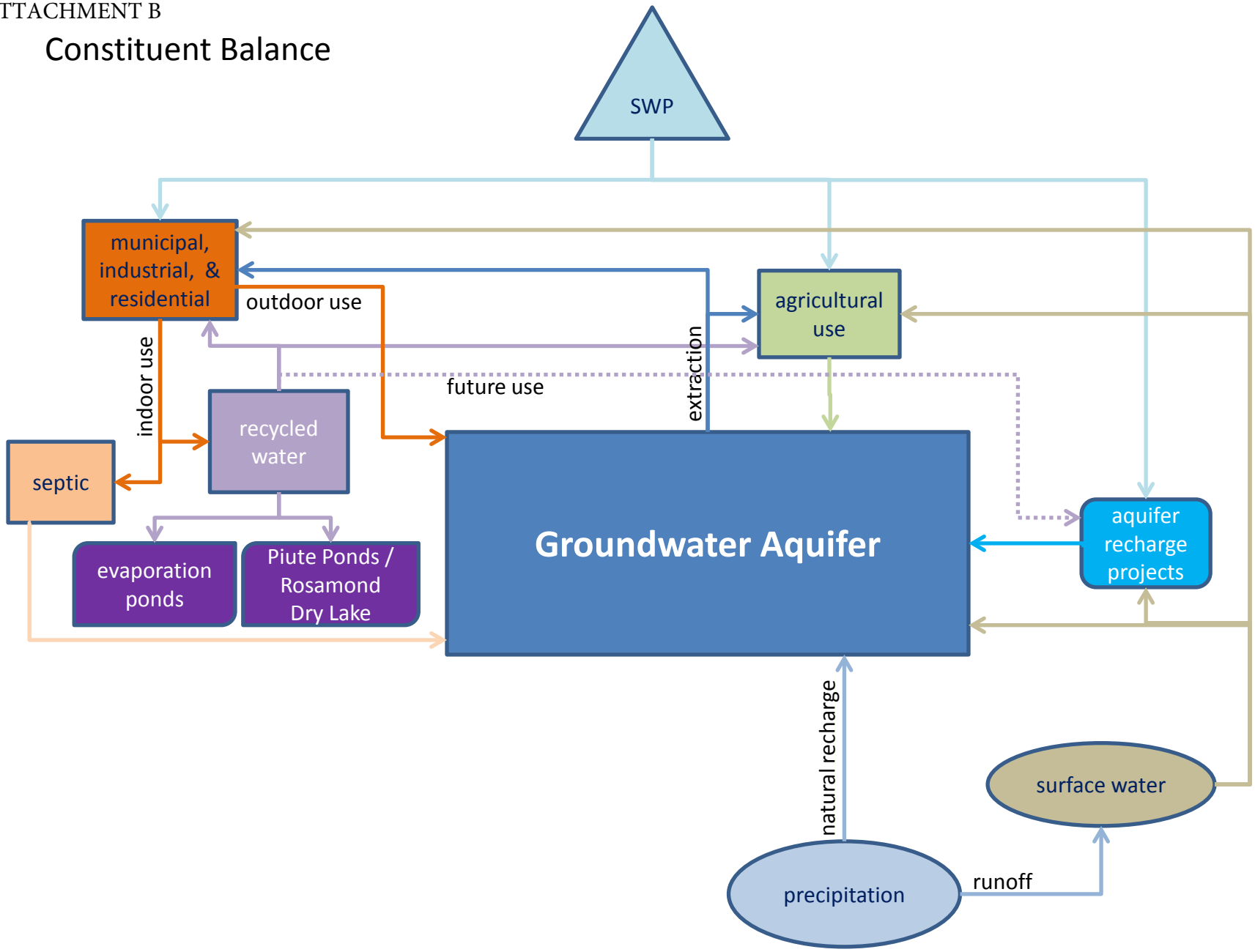
Salt & Nutrient Aquifer Loading/Unloading

Considered insignificant:
– subsurface inflow from other basins
– subsurface outflow



ATTACHMENT B

Constituent Balance



ATTACHMENT C

Assumed 2010 Quantities in Groundwater Model for Antelope Valley (11/20/13)

Flows	**Assumed Quantities**
Surface Water (AVEK SWP)	71k AFY total (Will reach 100kAFY?) AVEK Agr., 7k AFY AVEK (M&I) = 53k AFY PWD (M&I) = 10 k AFY LCID (M&I) = 1 k AFY
M&I Use	64k kAFY (from M&I sources above, 55% outdoor, 45% indoor)
Septic Tanks flows	1.5 k AFY (5% of total M&I indoor use, need to check)
Recycled water	25 kAFY (Indoor use – septic – evaporation ponds/Piute ponds)
Surface water reaching aquifer	M& I = 30%, Agr. =20%, Recycled water = 10%, Septic tanks = 100%
Infiltrated flows from SW	16 kAFY
Natural recharge	70k AFY (Infiltration of stormwater, no inflow from adjacent aquifers)
Total Groundwater pumped	110 kAFY at steady conditions, but may vary (80% = agr.)
Groundwater return flows	24 kAFY
Total inflow to Groundwater	110 kAFY (Natural = 70 kAFY, Surface Water = 12 k AFY, Recycled water = 2.5 kAFY, Septic = 1.5 kAFY, Groundwater return flows = 24 kAFY)
Aquifer volume	55M AF
Flows to Rosamond Dry lake and Evaporation Ponds	3 AFY (Need to check)
Constituents	**Assumed Quantities**
Amount of salts reaching GW	100 % (may be lower for well managed/regulated projects)
Natural recharge TDS	200 mg/l (100-300?)
Initial aquifer TDS	321 mg/l
SWP water	300 mg/l
Salts not reaching aquifer	Reclaimed water to Piute and Evap. Ponds

Assumptions and numbers found herein are for discussion only. The purpose is to project future groundwater quality conditions using a salt balance model for the Antelope Valley Groundwater Basin.

Notes & Assumptions for Salt Management and Nutrient Groundwater Model for the Antelope Valley

General

- Excel-based model created by Waterworks and LACSD
- Considers imported water and local groundwater (quantity and quality), and Principal aquifer
- Uses available data and best professional judgment for assumptions
- Focuses on TDS and chloride, but can incorporate other constituents. Nitrate will require additional considerations.
- Can incorporate existing and future projects (e.g., water banking)
- Compare/improve model based on future monitoring and smaller subunits (challenging)
- Check assumptions to improve model

Water Flow

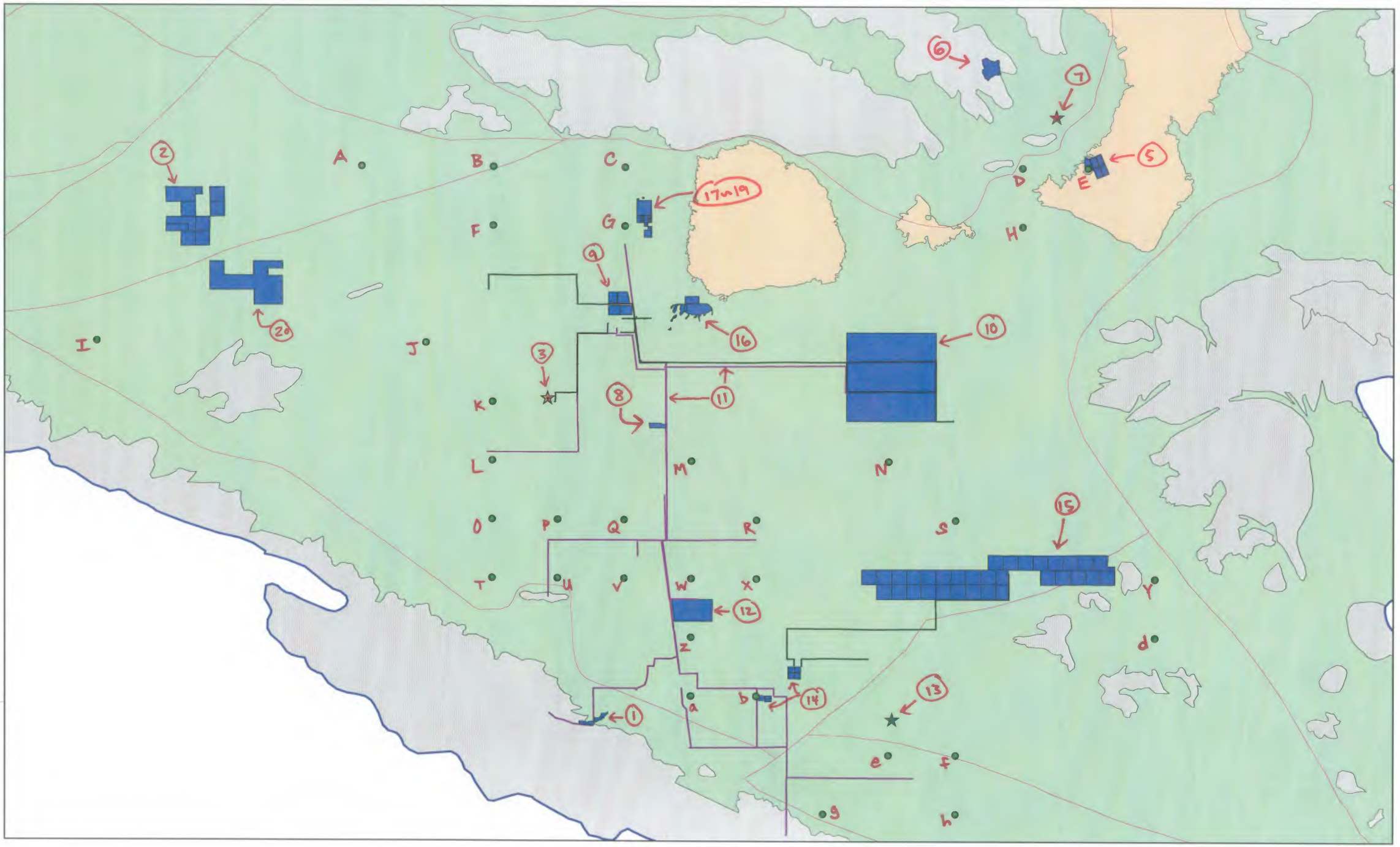
- Assumes instant impacts to groundwater and well-mixed aquifer
- Considers entire aquifer region (could try to split into subunits in the future, but challenging)
- Assumes approx. 110kAFY of total recharge (natural recharge plus return flows) to be consistent with IRWMP (Currently assumes approx. 70k AFY of natural recharge and approx. 40 kAFY of return flows from extracted groundwater, but can vary these on average and/or per wet/dry years, or better information)
- Surface water split into indoor use (to treatment plant and septic tanks) and outdoor use (irrigation of agriculture or other outdoor lawn irrigation/activities)
- Most agricultural use assumed from local groundwater (Smaller/decreasing agricultural use from imported water)
- Assumes a percent of water reaches groundwater , depending on source type & management
- Can incorporate groundwater flow in/out from/to other aquifers (for smaller scale), but these are ignored in large-scale model since they are considered insignificant for the Antelope Valley Basin
- Allows change in storage/level due to differences in inflow and outflow from/to aquifer (e.g., dry/wet years, water banking, other projects)

Constituent Flow

- Assumes 100% of salt reaches aquifer (conservative). Future iterations (may be adjusted – e.g., consider the regulated recycled water pivots)
- Model uses mass loadings from concentration and flow inputs/outputs, and calculates resulting volume, mass and concentration in aquifer assuming well-mixed aquifer on an annual basis
- Salt conveyed to Piute Ponds and Rosamond Dry Lake are assumed to exit model
- TDS of natural recharge assumed at 200 mg/l (100-300 mg/l?, little sensitivity)
- Groundwater TDS assumed at 321 mg/l in 2010 and reaches approximately 330 mg/l in 2035
- Imported water TDS assumed at 300 mg/l[i]

Assumptions and numbers found herein are for discussion only. The purpose is to project future groundwater quality conditions using a salt balance model for the Antelope Valley Groundwater Basin.

ATTACHMENT D



Potential Monitoring Wells

	Well ID	Utililty
A	1500421-001	?
B	1502569-001	First Mutual Water System
C	1510018-006	Rosamond CSD
D	1510701-008	Edwards Air Force Base
E	1510701-013	Edwards Air Force Base
F	1510018-009	Rosamond CSD
G	1503360-001	Diamond Jim S Casino
H	1510701-011	Edwards Air Force Base
I	1910067-211	LA Dept of Water and Power
J	1910246-004	Land Project Mutual Water Company
K	1910070-049	Waterworks District 40 (Reg 4 & 34)
L	1900929-001	Mira Loma High Desert Hospital
M	1910070-011	Waterworks District 40 (Reg 4 & 34)
N	1900751-001	Eastside Elementary
O	1910103-007	Palm Ranch Irrigation District
P	1910130-009	Quartz Hill Water District
Q	1910070-034	Waterworks District 40 (Reg 4 & 34)
R	1910070-070	Waterworks District 40 (Reg 4 & 34)
S	1910070-036	Waterworks District 40 (Reg 4 & 34)
T	1910103-001	Palm Ranch Irrigation District
U	1910130-006	Quartz Hill Water District
V	1910070-026	Waterworks District 40 (Reg 4 & 34)
W	1910070-091	Waterworks District 40 (Reg 4 & 34)
X	1910097-004	Northrop Grumman Corporation
Y	1910027-002	Waterworks District 40 (Reg 35)
Z	1910137-007	The Boeing Company - HDAIT
a	1910102-015	Palmdale Water District
b	1910102-009	Palmdale Water District
d	1910005-008	Waterworks District 40 (Reg 38)
e	1910102-027	Palmdale Water District
f	1910064-008	Littlerock Creek Irrigation District
g	1910102-021	Palmdale Water District
h	1910203-005	Waterworks District 40 (Reg 24, 27 & 33)

SNMP: Current and Future Projects

	Project	Notes
1	Amargosa Creek Recharge Project	
2	Antelope Valley Water Bank	
3	Apollo Community Regional Park	approx. location
4	EAFB Air Force Research Laboratory Treatment Plant	location unknown
5	EAFB Evaporation Ponds	
6	EAFB Landscape Irrigation	
7	EAFB Main Base Wastewater Treatment Plant	approx. location
8	e-Solar Sierra SunTower Power Plant	
9	Lancaster WRP Upgrade and Expansion	
10	Lancaster WRP Eastern Agricultural Site	
11	North Los Angeles/Kern County Regional Recycled Water Project	
12	Palmdale Hybrid Power Plant Project	
13	PWD/Littlerock Creek Groundwater Recharge	approx. location
14	Palmdale WRP Upgrade and Expansion	
15	Palmdale WRP Agricultural Site	
16	Piute Ponds	
17	RCSD Wastewater Treatment Plant Expansion	
18	RCSD Wastewater Treatment Plant Evaporation Ponds	
19	RCSD Wastewater Treatment Plant Recycled Water Use	
20	Water Supply Stabilization Project (WSSP-2)	