SGMA Requirements and Relevance to Regional Climate Change Data and Conditions

Santa Margarita Groundwater Agency
Board Meeting
December 11, 2019

SGMA Regulations § 354.18

- Projected water budgets shall be used to estimate future baseline conditions of supply, demand, and aquifer response to Plan implementation and to identify the uncertainties of these projected water budget components.

  (A) Projected hydrology shall utilize 50 years of historical precipitation, evapotranspiration, and streamflow information as the baseline condition for estimating future hydrology. The projected hydrology information shall also be applied as the baseline condition used to evaluate future scenarios of hydrologic uncertainty associated with projections of climate change…

SGMA Regulations § 354.18

(B) …The projected water demand information shall also be applied as the baseline condition used to evaluate future scenarios of water demand uncertainty associated with projected changes in local land use planning, population growth, and climate.

(C) The projected surface water supply shall also be applied as the baseline condition used to evaluate future scenarios of surface water supply availability and reliability as a function of the historical surface water supply identified in Section 354.18(c)(2)(A), and the projected changes in local land use planning, population growth, and climate.

SGMA Regulations § 354.18

- Each Plan shall rely on the best available information and best available science to quantify the water budget for the basin in order to provide an understanding of historical and projected hydrology, water demand, water supply, land use, population, climate change, sea level rise, groundwater and surface water interaction, and subsurface groundwater flow.

The Climate Data Take Away….

Historic and current data MUST be used by a GSA to assess, and defensibly account for future climate uncertainty within an entire basin.

Sustainable Management Criteria

- The GSP must define Measurable Objectives and Minimum Threshholds for each applicable Sustainability Indicator.

- Conditions that drop below a Minimum Threshold are Undesirable Results.

- The Space between a Measurable Objective and a Minimum Threshold is the Margin of Operational Flexibility.

Sustainable Management Criteria

- The Margin of Operational Flexibility is a locally driven decision, accounting for uncertainty (including climate change), and considering existing and potential significant and unreasonable impacts to Beneficial Users.

Example 2

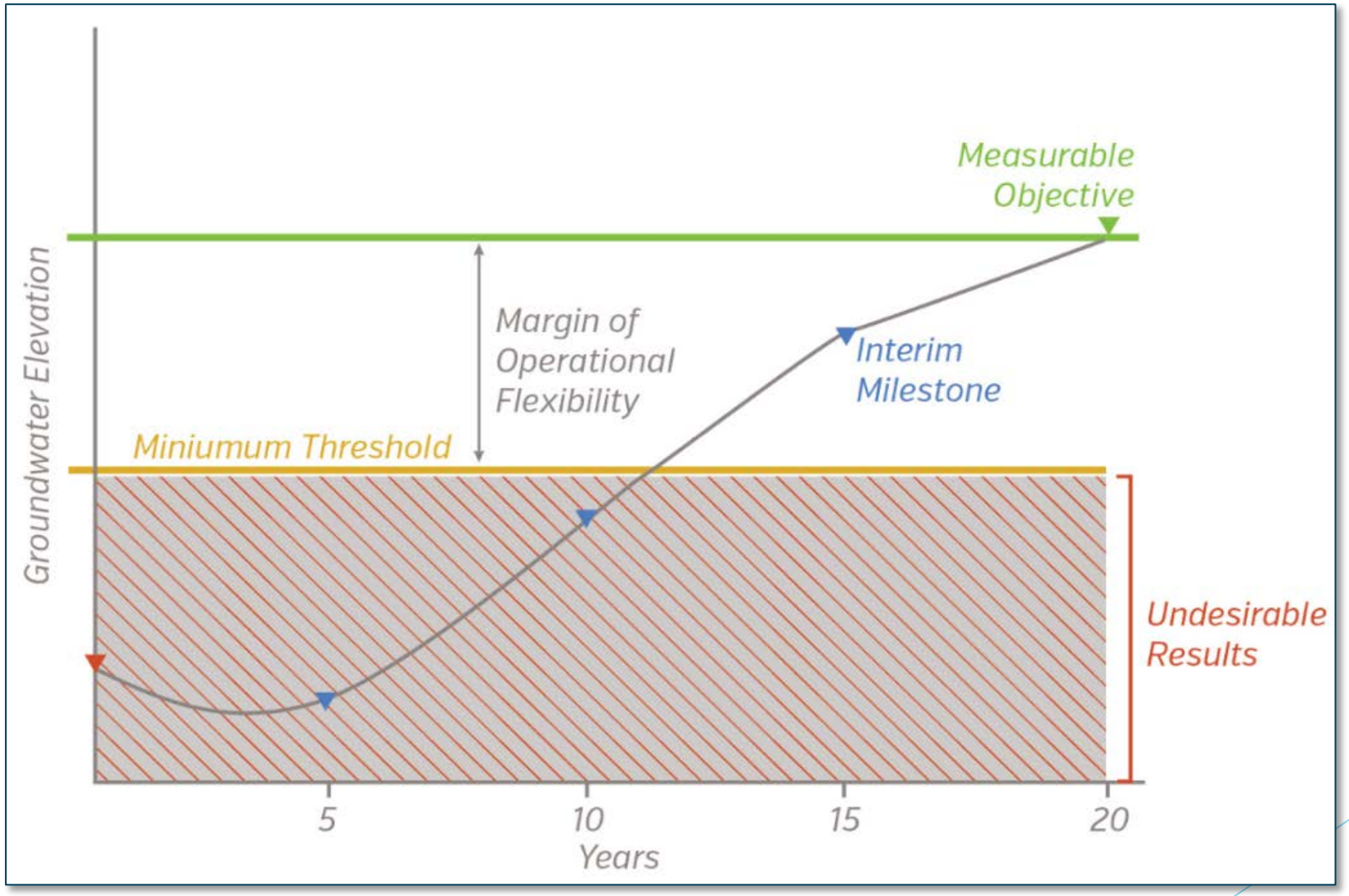

Measurable Objective
Margin of Operational Flexibility
Interim Milestone
Miniumum Threshold
Groundwater Elevation
Undesirable Results
5
10
15
20
Years

Table 1: Climate Change 2020-2069 Compared to Reference Historical 1984-2015 Period

Scenario	Average Precipitation (%)	Average Minimum Temperature (°F)	Average Maximum Temperature (°F)
CMIP5 all	3.16	2.68	2.59
CMIP5 all RCP4.5	1.68	2.35	2.26
CMIP5 all RCP8.5	4.66	3.02	2.91
CMIP5 WSIP	1.79	2.82	2.74
CMIP5 WSIP RCP4.5	0.47	2.48	2.45
CMIP5 WSIP RCP8.5	3.11	3.16	3.04
CMIP3-GFDL-CM-A2 downscaled at Santa Cruz Co-op Station	-1.46	1.2	2.2
Catalog at Santa Cruz Co-op Station	-10.2	0.78	2.29

Notes: Historical Reference for CMIP5 is GCM results for 1984-2015
Historical reference for GFDL and Catalog is 1984-2015 dataset at Santa Cruz Co-op station.

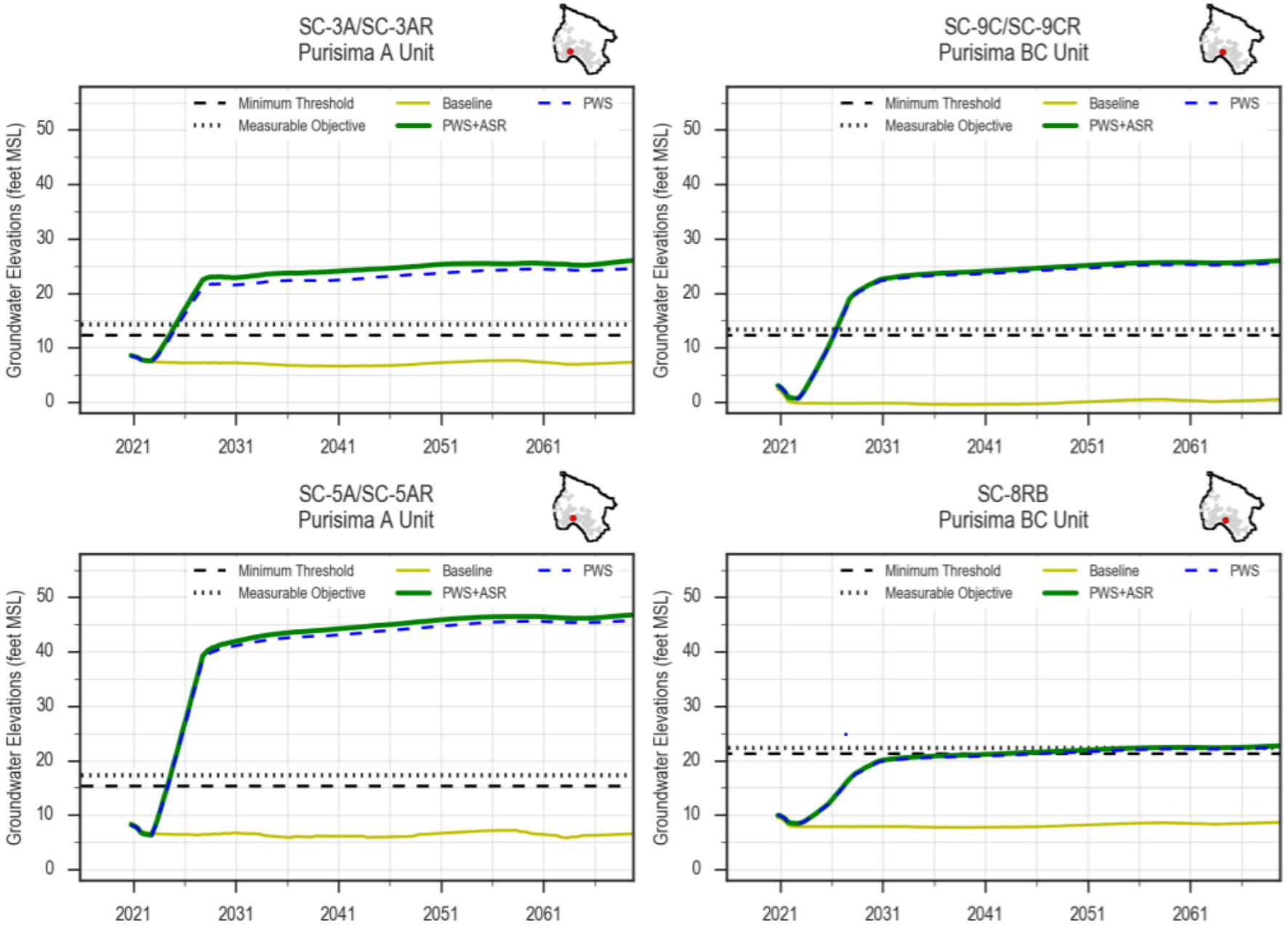
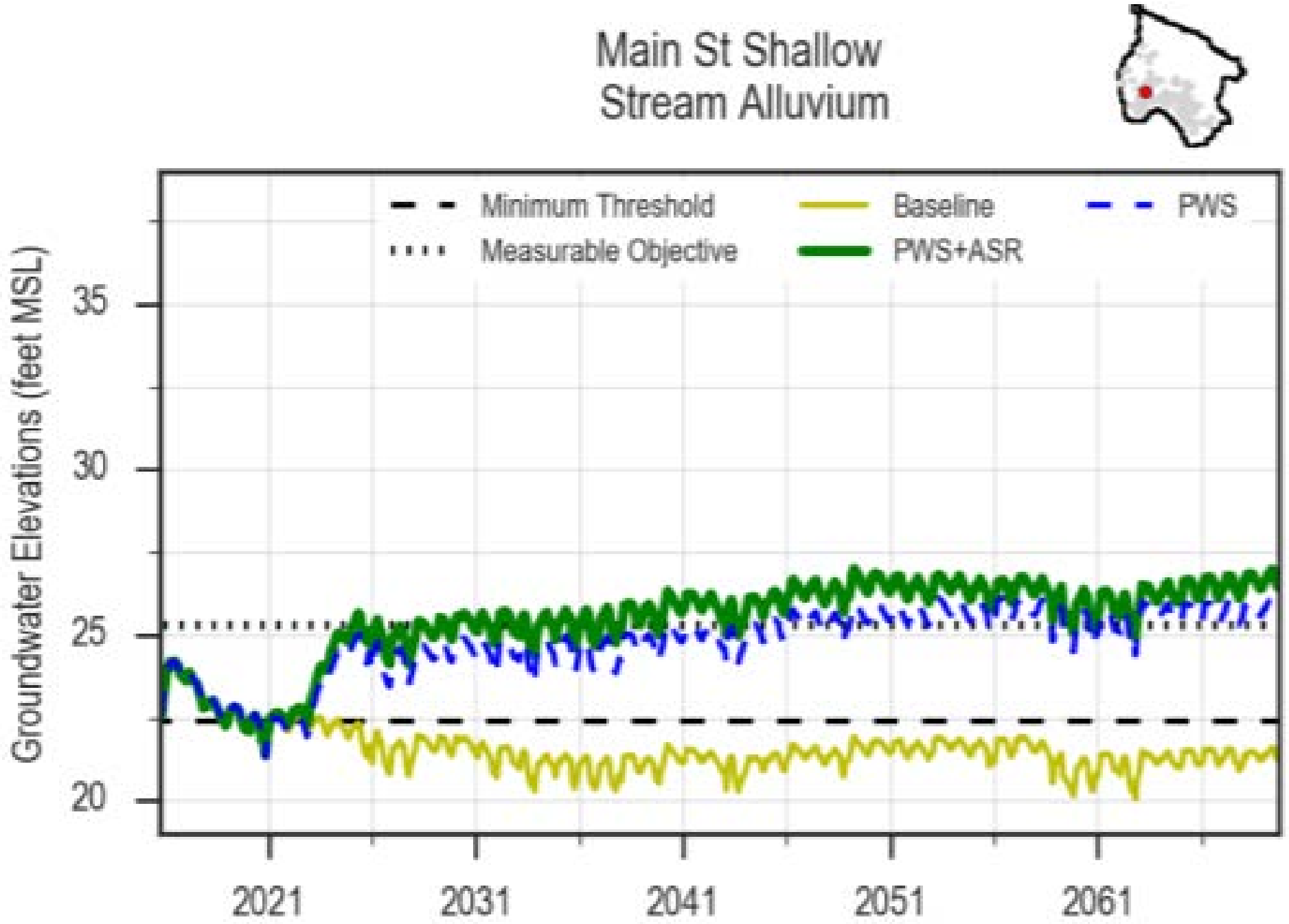
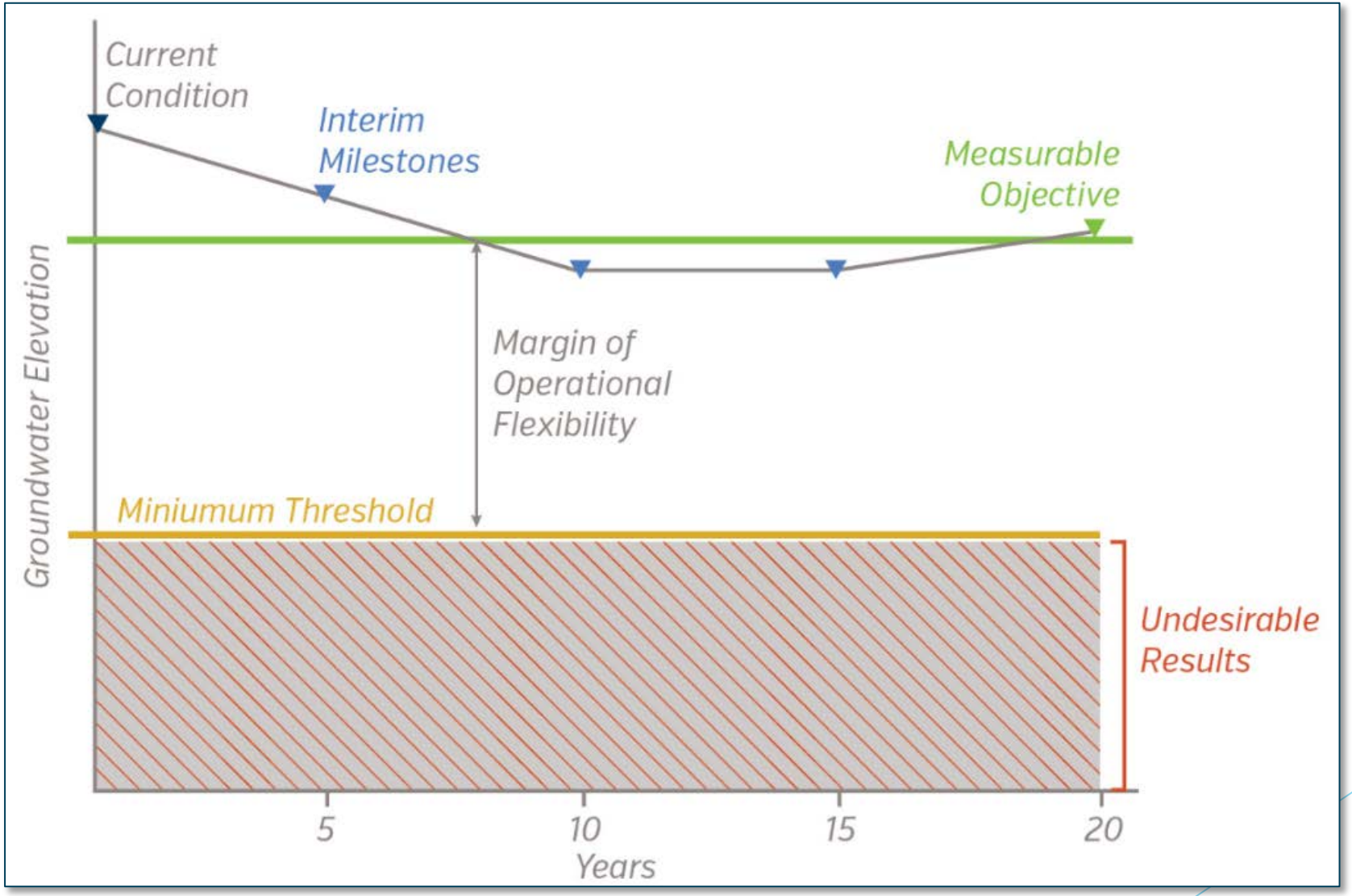


Figure 4-1. Five Year Averages of Model Simulated Groundwater Elevations at Coastal Monitoring Wells in Purisima A and BC Units


Main St Shallow
Stream Alluvium
Minimum Threshold
Measurable Objective
Baseline
PWS+ASR
PWS
Groundwater Elevations (feet MSL)
35
30
25
20
2021
2031
2041
2051
2061

Example 1


Current Condition
Interim Milestones
Measurable Objective
Groundwater Elevation
Margin of Operational Flexibility
Miniumum Threshold
Undesirable Results
5
10
15
20
Years