Cambria Emergency Water Supply Project

Cambria Community Services District

Emergency Water Supply Project Update

CDM Smith®

August 27, 2014

Agenda

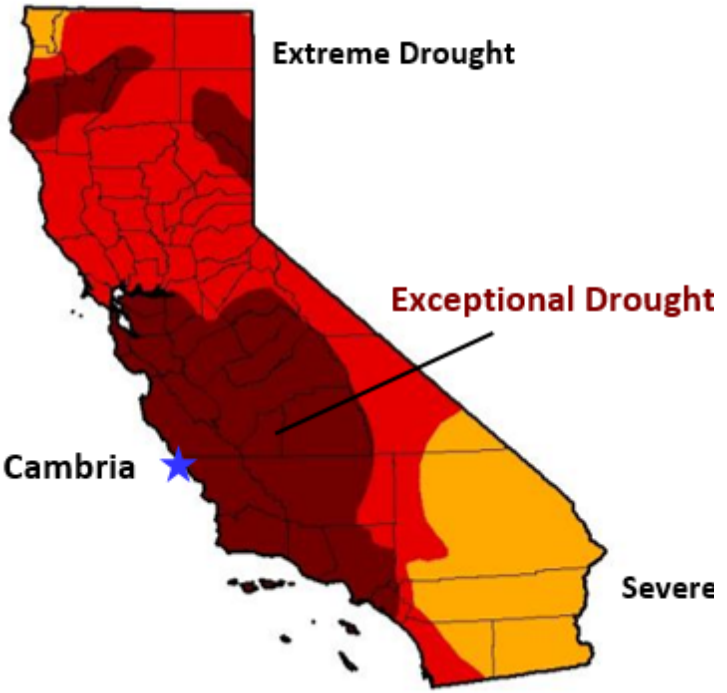
- Introductions
- Project need
- Historical studies
- Overview of Emergency Supply Project
- Hydrology/Mitigation Flow/Quality of Discharge to Lagoon
- Evaporation Pond
- Biological resources
- Land use & mitigation measures
- Progress to date
- Questions & Answers

Introductions

- CCSD President - Jim Bahringer
- CCSD Vice President – Gail Robinette
- CCSD General Manager – Jerry Gruber
- CCSD District Engineer - Bob Gresens, P.E.
- WTP Engineer – CDM Smith, Greg Wetterau, PE
- Hydrogeologist – CDM Smith, Mike Smith, PG
- CEQA Project Manager – RBF, Rita Garcia
- Project Biologist – RBF, Tom McGill
- Regulator Specialist – RBF, Richard Beck
- Principal-in-Charge – CDM Smith, Mari Garza-Bird

State of CCSD Current Conditions

- Cambria is located in the “Exceptional Drought” area
- Rainfall this year is only 80% of minimum amount required to recharge local aquifers
- If drought continues then Community will run out of water
- Imperative to provide enough water for public health, safety, sanitation, and fire protection
- State OES is monitoring the situation closely
- Emergency measures are in place by CCSD with > 40% conservation occurring over past several months
- Emergency supply project is currently under construction with completion estimated to occur by November 14, 2014.



July 8, 2014
US Drought Monitor

Historical Studies

- USACOE study
- 28 identified options,
  - screened to 8 alternatives – developed high level concepts
  - Screened to 4 alternatives – full concepts developed and studied
- Public meetings
- Recommended alternative used as basis for the emergency water supply project

OVERVIEW OF EMERGENCY WATER SUPPLY PROJECT


Brine Evaporation Pond
MW-3
MW-1
MW-2
Advanced Water Treatment Plant (AWTP)
9P7
WWTP Effluent
Percolation Ponds
SS-3
SS-2
SS-1
MIW-1
RIW-1
San Simeon-Monterey Creek Rd.
Van Gordon Creek
San Simeon Creek
Van Gordon Creek Rd.
Cabrillo Hwy
1
San Simeon
Creek Lagoon
San Simeon
Creek Campsite
San Simeon State Park
To Cambria Water Supply
N
0
400
800
Feet
Google™ earth
Legend
New Monitoring Well
Existing CCSD Gradient Control Well and AWTP Source Water Well
Existing CCSD Municipal Potable Water Well (SS)
Potable Water Recharge Injection Well (RIW)
Product Water Pipeline to Injection Well
Filtrate Line to LIW
Existing CCSD Water Supply Pipeline
Brine Disposal Pipeline
AWTP Feed Water Pipeline
8-inch Well 9P7 Discharge Line

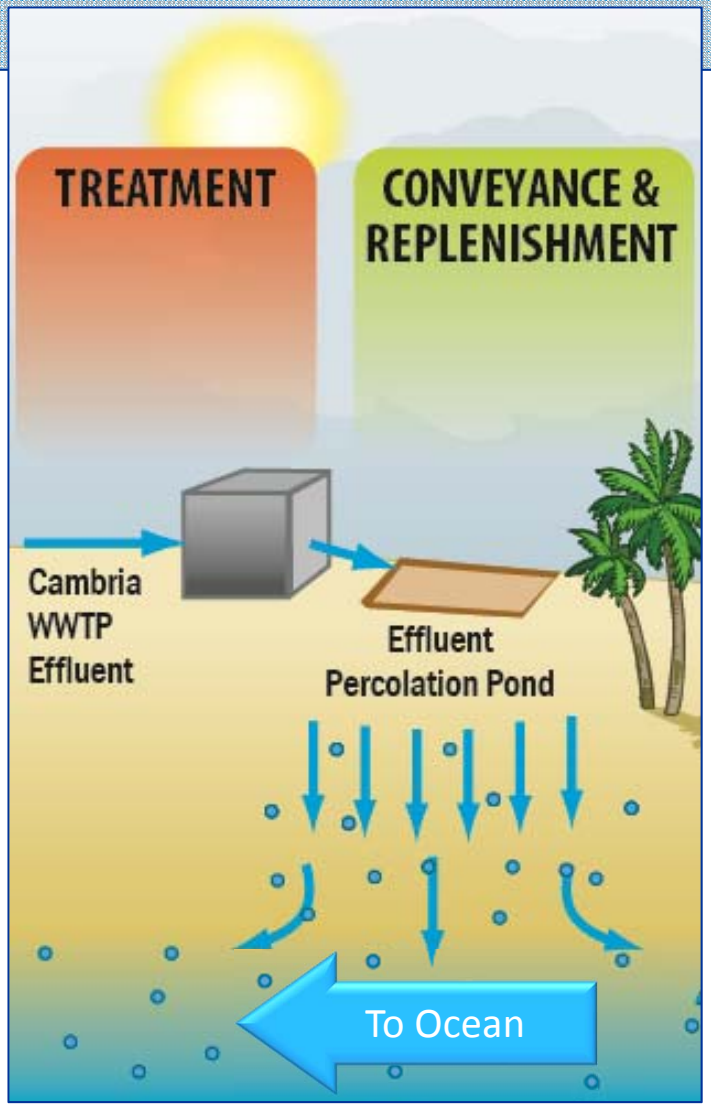

Brine Evaporation Pond
MW-3
MW-1
MW-2
Van Gordon Creek
San Simeon-Monterey Creek Rd.
Cabrillo Hwy
1
Advanced Water Treatment Plant (AWTP)
9P7
WWTP Effluent
Percolation Ponds
San Simeon Creek
San Simeon
Creek Lagoon
Van Gordon Creek Rd.
Van Gordon Creek
San Simeon State Park
San Simeon
Creek Campsite
SS-3
SS-2
SS-1
MIW-1
RIW-1
San Simeon Creek
To Cambria Water Supply
N
0
400
800
Feet
Google™ earth
Legend
New Monitoring Well
Existing CCSD Gradient Control Well and AWTP Source Water Well
Existing CCSD Municipal Potable Water Well (SS)
Potable Water Recharge Injection Well (RIW)
Product Water Pipeline to Injection Well
Filtrate Line to LIW
Existing CCSD Water Supply Pipeline
Brine Disposal Pipeline
AWTP Feed Water Pipeline
8-inch Well 9P7 Discharge Line

How much water will be produced?

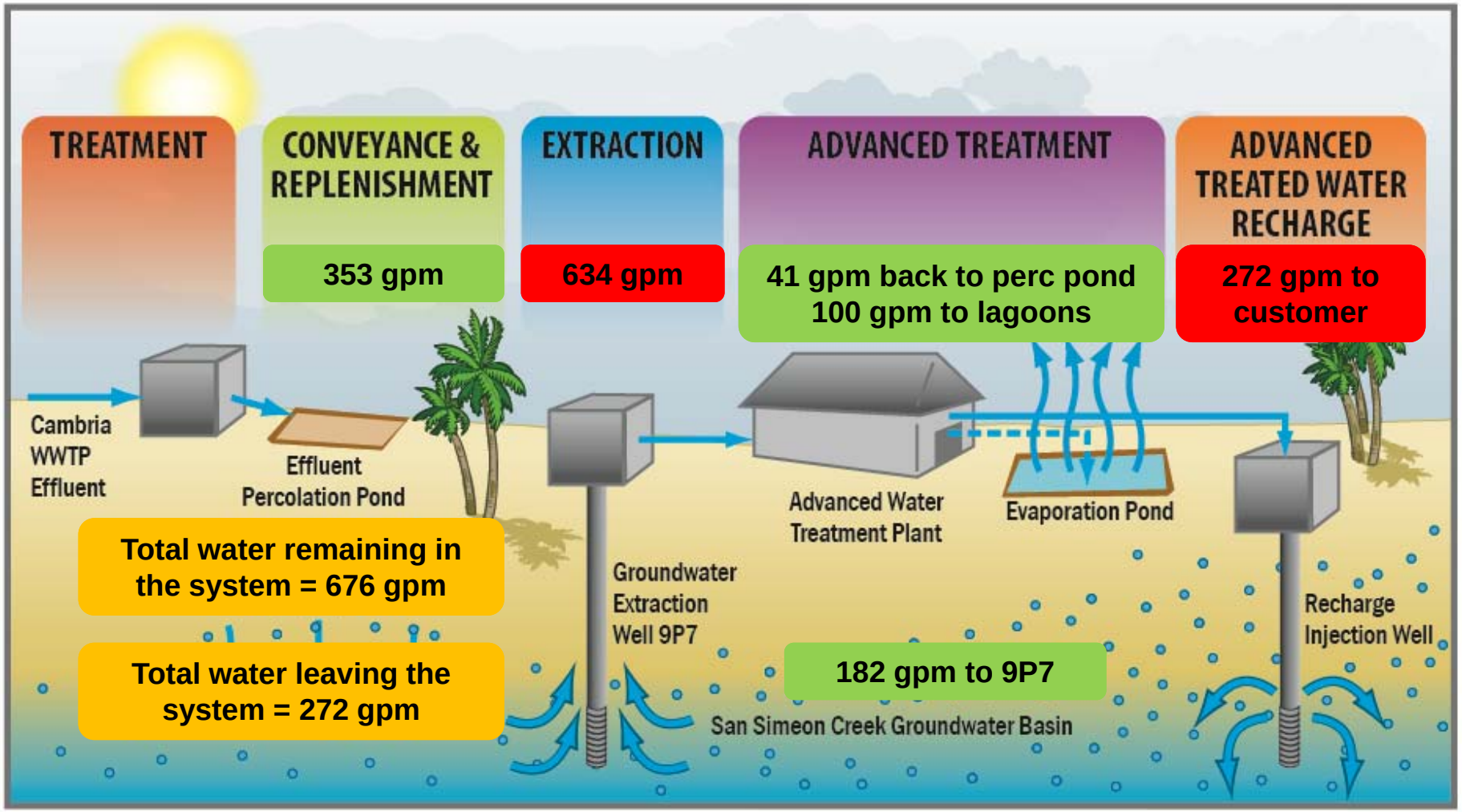
- 272 gpm of drinking water to CCSD customers
- Approximately 250 acre-feet of drinking water during the 6 month drought season

What Happens to Our Water Now?

- 0.5 mgd wastewater treated at WWTP
- Treated water sent to percolation ponds near San Simeon State Park
- All water, including basin underflow, ultimately ends up in ocean (>45 acre-feet/month)
- Emergency project will recover a portion of this water

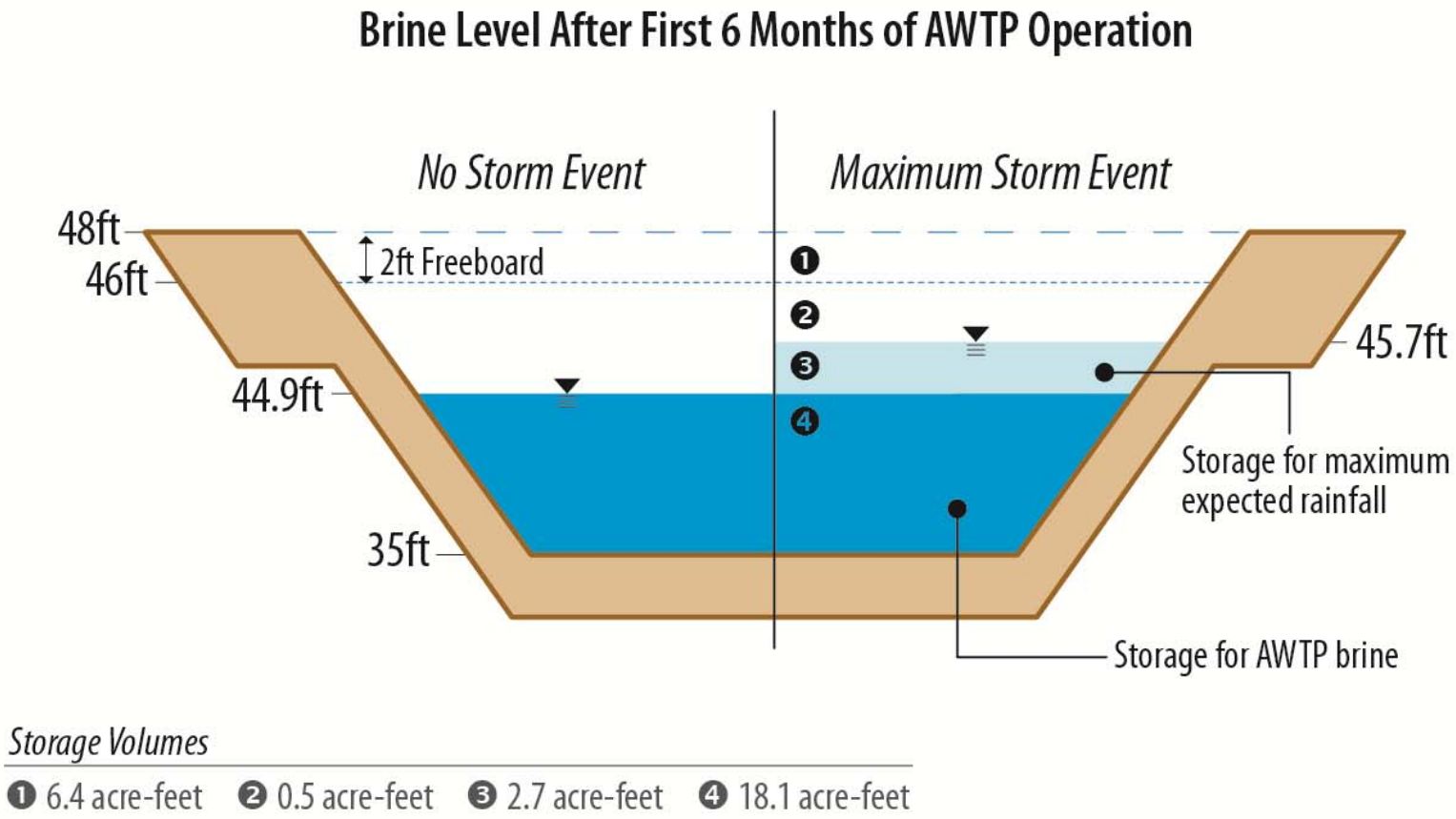


What is Groundwater Replenishment?



EVAPORATION POND

Evaporation Pond



Brine disposal to an evaporation pond

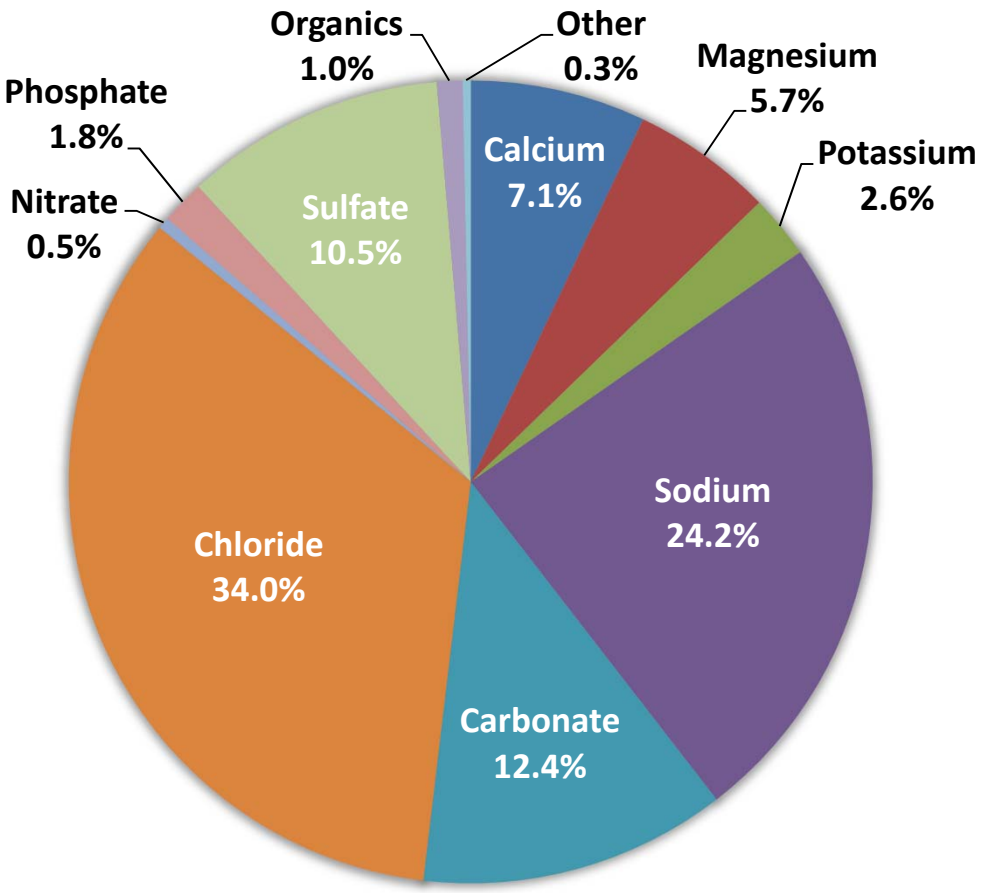
- Evaporation blowers operational conditions:
  - Evaporators will operate only when wind is blowing from west to east
  - Evaporators will not operate with wind speeds above 6mph
- Sound proofing will be provided for the blowers
- Weather station located on-site to monitor operational conditions

Evaporation Pond: Maximum Liquid Concentrations

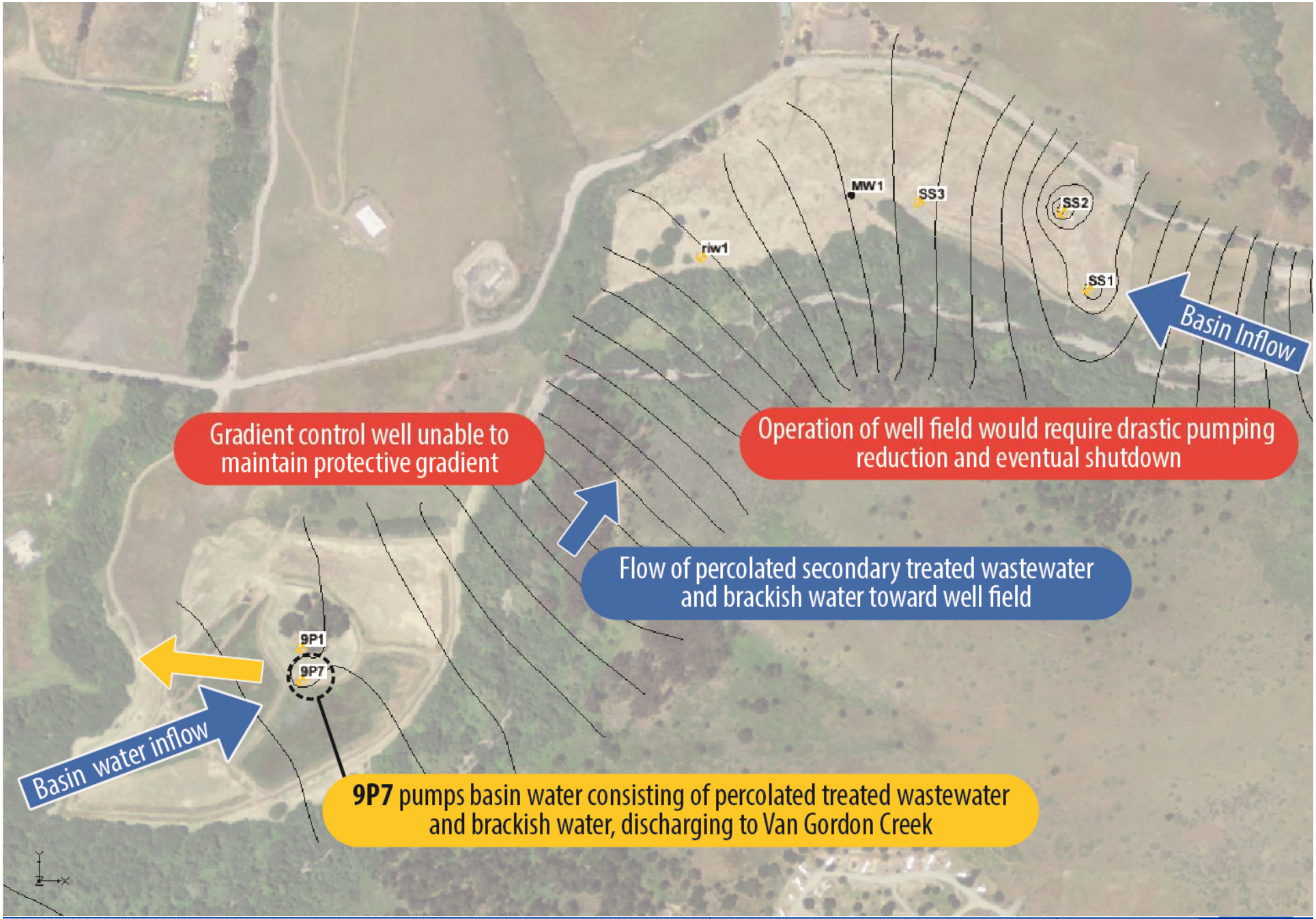
- Maximum concentrations reached in brine solution controlled primarily by solubility
  - Total TDS expected to reach 360,000 mg/L
  - 90% will be sodium chloride
  - Remaining salts will be primarily sodium carbonate and sodium sulfate

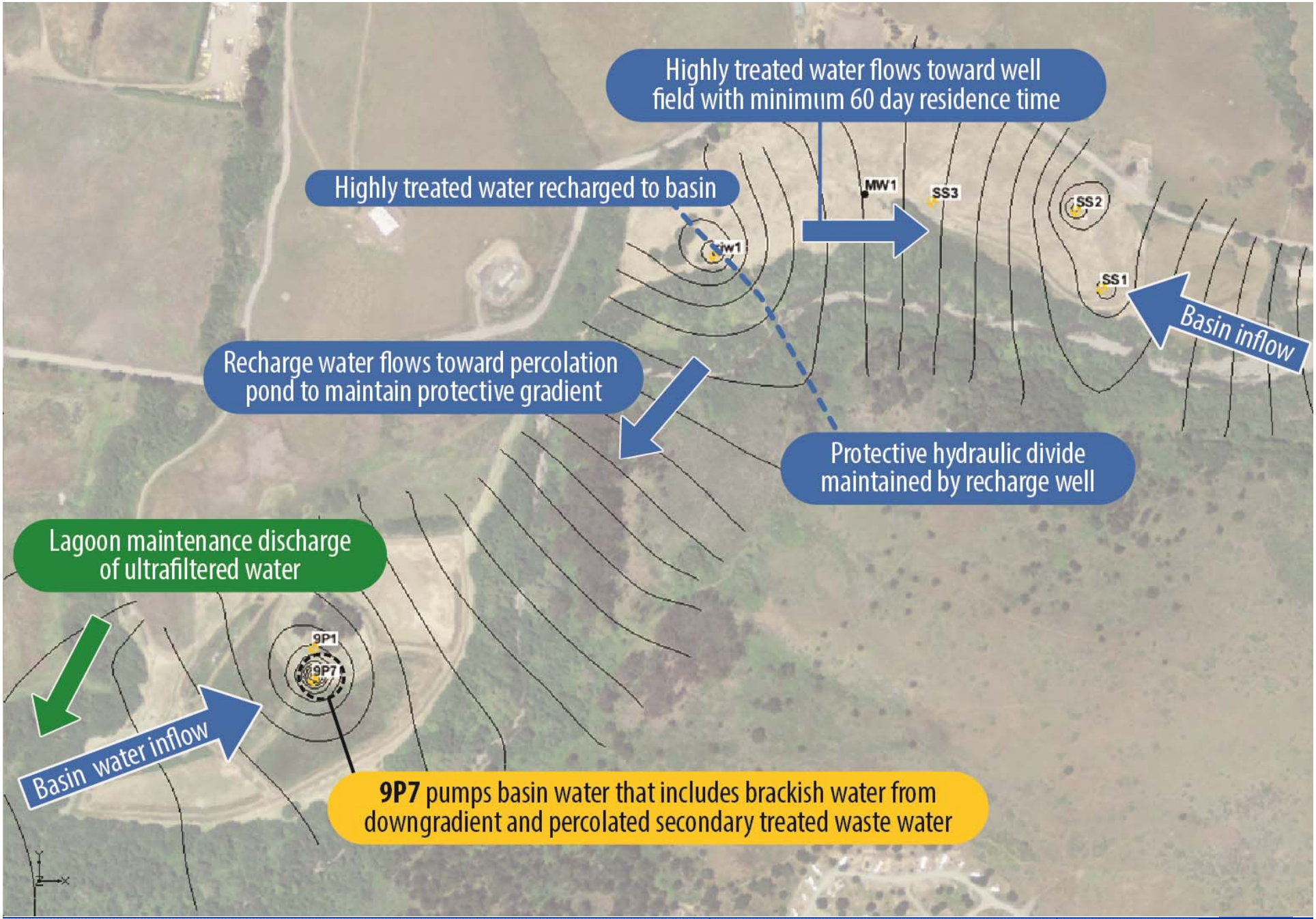
Evaporation Pond: Projected Constituents in Dry Solids

94% of solids will come from six constituents



HYDROLOGY/MITIGATION FLOW/QUALITY OF DISCHARGE TO LAGOON


MW1
SS3
SS2
riw1
SS1
Basin Inflow
Gradient control well unable to maintain protective gradient
Operation of well field would require drastic pumping reduction and eventual shutdown
Flow of percolated secondary treated wastewater and brackish water toward well field
9P1
9P7
Basin water inflow
9P7 pumps basin water consisting of percolated treated wastewater and brackish water, discharging to Van Gordon Creek


Highly treated water flows toward well field with minimum 60 day residence time
Highly treated water recharged to basin
MW1
SS3
SS2
SS1
Basin inflow
Recharge water flows toward percolation pond to maintain protective gradient
Protective hydraulic divide maintained by recharge well
Lagoon maintenance discharge of ultrafiltered water
9P1
9P7
Basin water inflow
9P7 pumps basin water that includes brackish water from downgradient and percolated secondary treated waste water

Tracer Test

- Pump from existing production wells SS1 and SS2 at a total of 454 gpm
- Inject at RIW-1 with addition of tracer
- Addition of tracer bromide salt at 10 ppm
- Cease addition of tracer after 30 days
- Total duration of test 67 days
- At end of test wells SS1 and SS2 continue producing at 454 gpm
- Gradient control pumping and discharge to lagoon not necessary during injection period

Lagoon with Ocean Discharge – March 2010

Lagoon Low Water – September 2010

Lagoon – August 2013

Upper Lagoon – July 2014

Lagoon Near Beach Berm – July 2014

Lagoon Mitigation Flow Evaluation Methods

- Groundwater model for basin used to assess lagoon water balance using the MODFLOW lake simulation package
- Uncertainties on hydraulic conductivity of lagoon sediments, so conservative assumption of good connectivity implemented during original calibration
- Lagoon geometry simplified to include typical summer extent
- Lagoon outlet elevation to ocean is modeled at 7 feet and lagoon water level allowed to rise as a function of inflows

Lagoon Calibration Update

- Stage monitoring in lagoon conducted over a 1 week period after model calibration
- During this period, an event caused a rise in water level followed by a fall of 7.3 inches over a 7 day period, a loss rate of 14,819 ft^3/day (77 GPM)
- This established the rate and the average change in head for lake conductance which was used for the comparative evaluation of mitigation alternatives

Simulation Approach

- The lagoon water balance evaluated under two climatic regimes
  - Normal conditions where surface flow in San Simeon Creek occurs December through April
  - Drought conditions include a two year period with no significant surface water inflow to the basin and native recharge reduced
  - Antecedent period assumes normal runoff for both scenarios
- Current CCSD operations simulated for each of these climatic scenarios as a baseline
- Proposed water supply alternative simulated for the two climatic conditions with lagoon mitigation flows of 0, 50, 100 and 150 gpm during the 6 month dry season

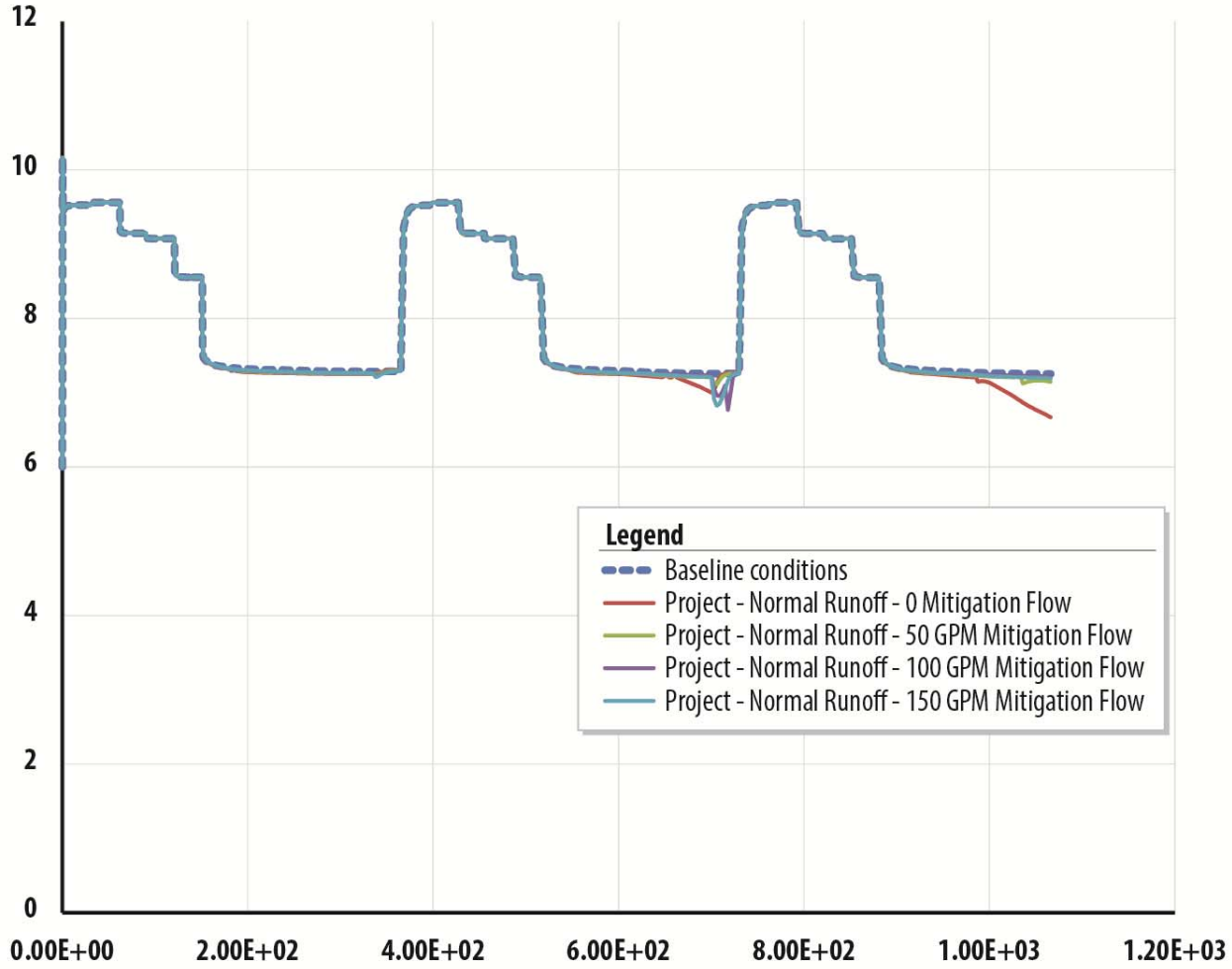
Baseline Operating Assumptions

- San Simeon well field production at permitted rate 454 gpm
- Percolation pond recharge 353 gpm
- Gradient control well 25 gpm (June – October during drought years), assume not needed during normal years
- Gradient control discharge to Van Gordon creek
- Irrigation wells operate during dry season
- Permit for well field requires maintenance of a protective gradient between the percolation ponds and the well field

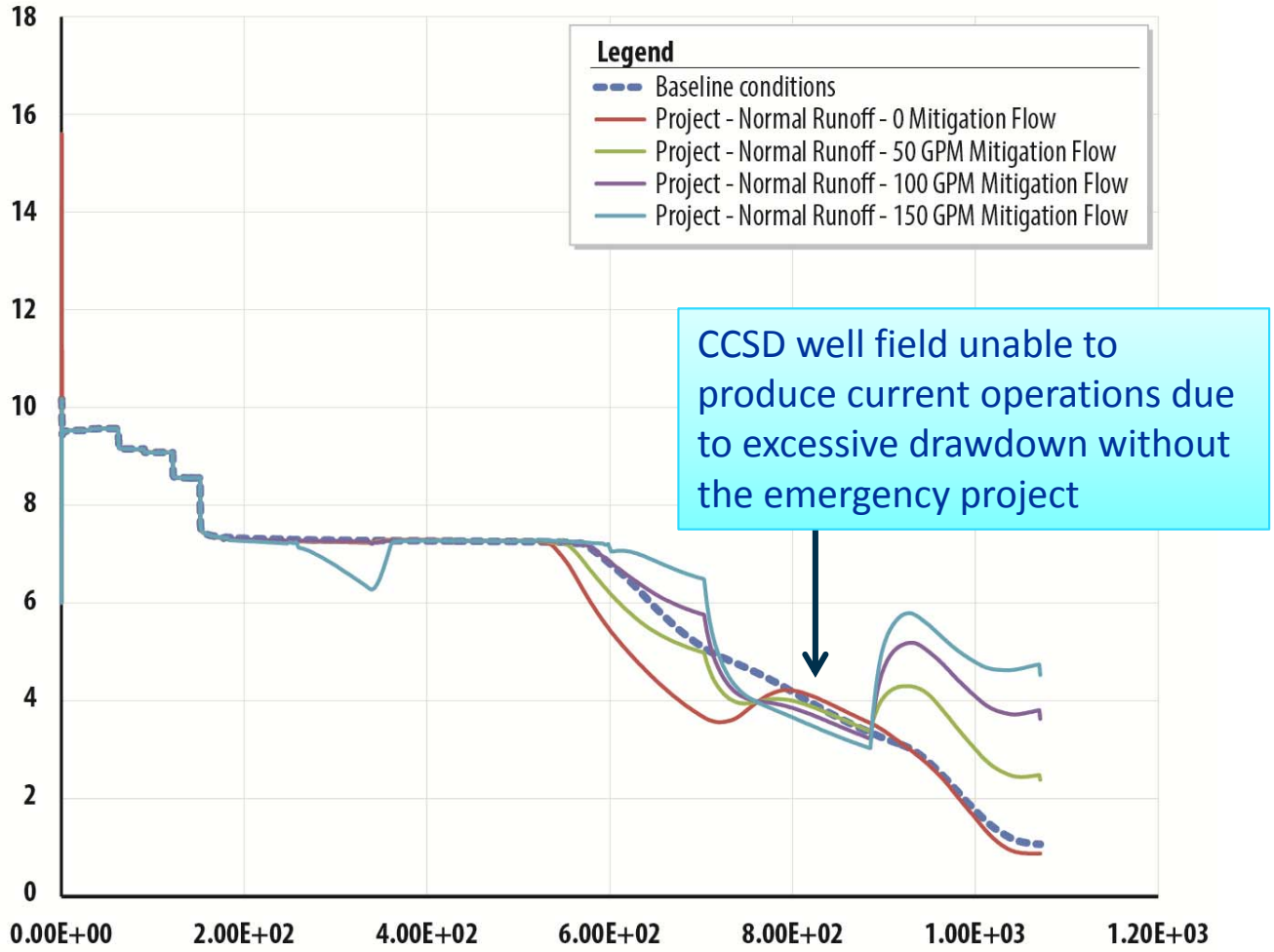
Project Operating Assumptions

- San Simeon well field production rate 454 gpm
- Percolation pond recharge 353 gpm
- RIW-1 recharge 454 gpm
  - Maintains protective gradient from Percolation Pond area
  - Provides recharge to CCSD well field after residence time
- 9P7 pumping 634 gpm
  - RIW-1 recharge 454 gpm
  - Ultrafilter backwash discharge to percolation ponds 40 gpm
  - Discharge brine to evaporation pond 40 gpm
  - Mitigation discharge to lagoon 100 gpm
- Reverts to baseline conditions during wet season
- Irrigation wells operate during dry season

Comparison of Baseline and Project Operations – Normal Runoff Conditions



Comparison of Baseline and Project Operations – Extended Drought Conditions



Summary Normal Runoff Conditions/ Non Drought Conditions

- No significant impact on lagoon stage from current project operations
- Mitigation flows not necessary under normal runoff climatic conditions

Summary Of Extended Drought Conditions

- Without emergency water supply project:
  - CCSD well field production will not be feasible after second drought season due to depletion of the basin storage
  - The lagoons will cease to exist
- With emergency water supply project:
  - Mitigation flow of 100 GPM more than sufficient to maintain lagoon water levels above elevation 3 feet during extended droughts
  - During second drought year water levels during project operations increase to about 5 feet

Project Advantages

- Project implementation will allow continued operation of the CCSD well field
- Stage in the lagoon will be maintained at or above baseline conditions with 100 GPM mitigation flows

BIOLOGICAL RESOURCES

Establishing Baseline Conditions for the Adaptive Management Plan

- CCSD conducted annual aquatic surveys from 1992 to 2006
  - San Simeon Lagoon surveyed once in early summer, once in the fall for tidewater goby
  - San Simeon Creek surveyed once in early summer for steelhead
  - Surveys of adjacent lagoons and creeks:
    - Santa Rosa Lagoon surveyed once in early summer, once in the fall for tidewater goby
    - Santa Rosa Creek surveyed once in early summer for steelhead

Additional Efforts

- RBF proposes conducting the following focused surveys as part:
  - Tidewater goby (lagoon)
  - California red-legged frog (lagoon/creek)
  - Steelhead (lagoon/creek)

Existing Steelhead Data

- South-Central California Steelhead Recovery Plan (December 2013)
  - San Simeon Creek population is listed as a “Core 1” population indicating highest recovery priority
  - Groundwater extraction is listed as a “very high threat”
  - Recovery plan suggests a study is needed to assess groundwater extraction impacts
  - San Simeon Creek is in Critical Habitat, Estero Bay Hydrologic Unit

Endangered Species Approvals

- The Corps will initiate Section 7 consultation with USFWS/NMFS for potential impacts from this project once a 404 application is submitted
- Biological monitoring as part of the AMP will help provide ongoing data on the effects of groundwater extraction

Agency Consultation

- Both USFWS and CDFW requested AMP as part of a Section 7 consultation
- Coastal Commission requirements:
  - Riparian and wetland 100-foot buffer zones
  - Protection of riparian and terrestrial vegetation
  - Protection of steelhead streams and fish migration

CWA 404 Permitting Requirements

- Triggers Federal Nexus for Section 7
- RBF conducted a jurisdictional delineation of the site in August 2014
- State and Federal waters/wetlands mapped

Jurisdictional Wetlands/Waters

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS
Corps/Regional Board Jurisdictional Map
Exhibit 1

Jurisdictional Wetlands/Waters

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS
CDFW Jurisdictional Map
Exhibit 2

Jurisdictional Wetlands/Waters

CAMBRIA EMERGENCY WATER SUPPLY PROJECT
DELINEATION OF STATE AND FEDERAL JURISDICTIONAL WATERS
CCC Jurisdictional Map
Exhibit 3

Potential Effects to Local Waterways

- Groundwater modeling indicates minimal adverse effects will occur
- Some level of uncertainty exists
- The AMP will help track and respond to any changes, adverse or beneficial, in habitat structure

Mitigation Program

- Preparation of a CWA 404 Permit
  - Section 7 Consultation with USFWS/NMFS
  - Adaptive Management Plan will be prepared as part of the Section 7 Consultation in "coordination and collaboration" with USFWS/NMFS
    - Biological Monitoring
    - GW and Surface Water Monitoring and Modeling
    - Ongoing Focused Surveys
    - Data Review/Analysis
    - Series of Adaptive Management Measures
    - Reporting Process

LAND USE & MITIGATION MEASURES

CEQA Status/Schedule

- IS/MND 30-day public review period June 23 – July 22, 2014
- Project modifications, since IS/MND Release
- Necessitate IS/MND Revisions
- Constitute “Significant New Information”
- Next CEQA steps under evaluation

Land Use

- Mechanical spray evaporators
- Sensitive receptors
  - Hearst San Simeon State Park campgrounds & trail
  - Van Gordon Creek Corridor


1
Cabrillo Hwy
San Simeon-Monterey Creek Rd.
Van Gordon Creek
San Simeon-Monterey Creek Rd.
San Simeon Creek
Brine
Evaporation
Pond
Hearst San Simeon State Park
San Simeon Creek Campground
Van Gordon Creek Rd.
WWTP Effluent
Percolation Ponds
San Simeon Creek
San Simeon
Creek Lagoon
Van Gordon Creek
Hearst San Simeon State Park
Washburn Primitive Campground
San Simeon State Park
Cabrillo Hwy
1
N
0
400
800
Feet
Google™ earth

Potential Effects

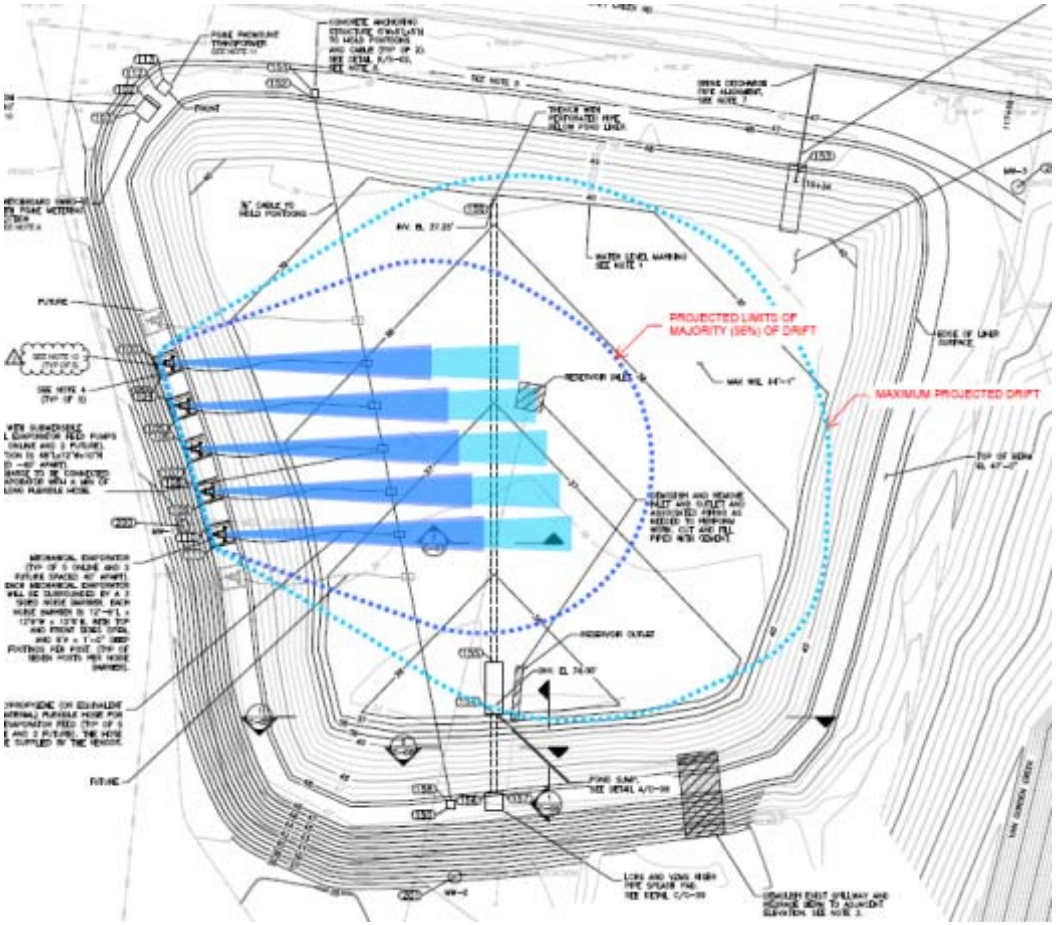
- Aesthetics and lighting
- Brine drift
- Noise – Construction-related
- Noise – Operational

Aesthetics and Lighting

- No lighting proposed
- San Simeon Creek corridor to the south buffers project
  - Not visible to Washburn Primitive Campground
  - Not visible to trail
- Proposed native vegetation along western boundary to buffer project (MM AES-2)
- Not Visible to San Simeon Creek Campground
- Including nearest sites 18, 19, 21, 23, and 24

Brine Drift

- Controlled through onsite weather stations
- Operations restricted - wind speed/direction, temperature, and humidity
- Drift contained within evaporation pond



Noise – Construction-Related

- Acoustically dispersed and Intermittent
  - Short-term Intermittent Exposure in Excess of Standards Could Occur
  - Nesting Bird Clearance Survey (MM BIO-10) Prior to Construction
  - Project is a Noise Exempt Noise Source
    - Equipment Connected With Emergency Activities
    - Construction Noise Sources Provided Within Restricted Hours

Noise – Operational

- AWTP noise contained within containers
- Evaporators include soundwall enclosures
- Below CZLUO noise standards of 45/50dBA (day/night) @ nearest receptors
- 42 dBA at western property line (distance of 200 feet)
- 40 dBA at San Simeon Creek Washburn Primitive Campground (distance of 250 feet to nearest sites)
- 38 dBA at Van Gordon Creek Corridor (distance of 400 feet)

County Growth Management Ordinance (GMO)

- "Allocation" of new units (i.e. "Growth") in Cambria is set at zero percent
- Any change would require:
  - Adoption of an amendment by the county board of supervisors
  - Environmental review under CEQA

PROGRESS TO DATE

Progress to Date

- Hydrogeological modeling completed in April
- IS/MND Posted
- Design completed this month
- All long-lead equipment has been ordered
  - Process Equipment
- Construction contract executed
  - Sub-contracts being finalized this week
  - Construction starting this week
  - Bio & Native Indian monitors in place
- Completion expected in November

QUESTIONS