



**UNITED STATES DEPARTMENT OF COMMERCE**  
**National Oceanic and Atmospheric Administration**  
NATIONAL MARINE FISHERIES SERVICE  
Southwest Region  
501 West Ocean Boulevard, Suite 4200  
Long Beach, California 90802-4213

APR 4 2012

Mr. Don Glaser  
Regional Director  
Mid-Pacific Region  
U.S. Bureau of Reclamation  
2800 Cottage Way, MP-3700  
Sacramento, California 95825-1898

Mr. Mark Cowin  
Director  
California Department of Water Resources  
P.O. Box 942836, Room 1115-1  
Sacramento, California 94236-0001

Dear Mr. Glaser and Mr. Cowin:

On January 12, 2012, Plaintiffs, Plaintiff-Intervenor, and Federal Defendants to the Consolidated Salmonid Cases (Case 1:09-cv-01053-LJO –DLB) signed and filed with the Federal court a joint stipulation (Document 659-2) that included Central Valley Project and State Water Project operations for April and May 2012. On March 16, 2012, NMFS transmitted to the U.S. Bureau of Reclamation and the California Department of Water Resources (DWR) the real-time operations technical memorandum required as part of the joint stipulation (Paragraph 2.a.v).

On Monday, April 2, 2012, DWR provided NOAA's National Marine Fisheries Service (NMFS) with Particle Tracking Model simulation results using the Delta Simulation Model 2. This information was distributed to the Delta Operations for Salmonids and Sturgeon (DOSS) working group for discussion at its Tuesday morning meeting (April 3, 2012). The Delta Conditions Team met on Monday, April 2, 2012, but did not provide additional information for DOSS to consider in the development of the DOSS advice.

The enclosure provides DOSS advice to the Water Operations Management Team and NMFS. DOSS advises that (1) an amendment be made to the calculation of the PTM screening criterion used to specify OMR levels based on modeling information, and (2) based on the amended PTM screening criterion calculation, that the projects be managed to an OMR level of -2,500 cfs from April 8-14, 2012. The 5-day running average of OMR flow during this period shall be no more than 25% more negative than -2,500 cfs (*i.e.*, -3,125 cfs).

NMFS accepts the DOSS advice, including the amendment to the calculation of the PTM screening criterion, and determines that the OMR flow of no more negative than -2,500 cfs from April 8-14, 2012, as measured by a 5-day running average that may not be more negative than



-3,125 cfs, is consistent with the intent and objective of OMR flow management, as provided in the technical memorandum. This OMR flow is within the range of between -1,250 and -3,500 cfs specified by the joint stipulation as the adaptive range for OMR during April 2012. NMFS determines that since the OMR flow for April 8-14, 2012, is consistent with the joint stipulation and associated technical memorandum, that it will avoid jeopardizing the continued existence of Central Valley steelhead.

NMFS notes that the 700 cfs change in the OMR flow limit for the April 8 through 14<sup>th</sup> period (-2,500 cfs) as compared to the OMR target for the April 1<sup>st</sup> through 7<sup>th</sup> period (-1,800 cfs) is largely due to changes in forecasted hydrology, for example, the increase in flows that are projected at Vernalis during the second week of April due to implementation of the Stanislaus River flow schedule under the NMFS biological opinion.

The technical memorandum provides flexibility in adjusting the order of the prescribed two-week OMR experimental treatment levels ("DOSS may adjust the ordering of OMR flow management targets opportunistically during April and May 2012," page 8 of the technical memorandum). The DOSS and the Water Operations Management Team considered and discussed adjusting the order of the OMR treatment levels in May, currently -1,250 cfs from May 1-14 and -5,000 cfs from May 15-31. However, there are many variables to consider (*e.g.*, water year type for the San Joaquin basin, delta smelt distribution and risk of entrainment, forecasted flows at Vernalis) before a change in the order of the OMR treatment is proposed. DOSS and WOMT will continue discussing the potential adjustment in the coming weeks.

NMFS appreciates the continued coordination of the parties towards the implementation of the joint stipulation and the technical memorandum.

Sincerely,



Rodney R. McInnis  
Regional Administrator

Enclosure

## **DOSS Advice for operations from April 8-April 14, 2012**

### **Old and Middle River Flow Management per the 2012 Joint Stipulation, in lieu of Action IV.2.1 of the NMFS Biological Opinion for the Long-Term Operations of the Central Valley Project and State Water Project (NMFS Opinion)**

#### **Summary of Advice from the Delta Operations for Salmonids and Sturgeon (DOSS) group:**

##### **Background:**

DOSS reviewed Particle Tracking Model (PTM) results provided by DWR on April 2, 2012 (Attachment 1). The data from scenarios (A-D), associated with predicted Vernalis flows of 2,500 cfs for the week of April 8 - 14, 2012, were evaluated using the process described in the OMR technical memorandum issued by NMFS on March 16, 2012<sup>1</sup> (OMR Memorandum) to specify the OMR level to be implemented for April 8-April 14, with an adjustment to the calculation of the PTM screening criterion described in the advice below.

##### **DOSS advice for Tuesday 4/3/12:**

Adjustment to the simulation period used to calculate the PTM screening criterion:

Advice: The OMR Memorandum (pages 6-8) describes the calculation of the PTM screening criterion as based on particle fates measured 28 days after particle insertion, but notes (footnote 3 on page 6) that "...under forecasted hydrology, the fates of a significant number of particles may not be resolved within 28 days. If DWR submits PTM information based on a simulation period longer than 28 days, DOSS will consider that information and may advise that the PTM screening criterion be amended." DOSS advises that the calculation of the PTM screening criterion be amended such that, for each scenario, the fraction of particles exiting the Delta system past Chipps Island, at the SWP, and at the CVP, be measured after a simulation period within which at least 50% of particles have been resolved in all scenarios. This simulation period will be determined as the number of days in which 50% of inserted particles have reached some fate in the scenario (either the baseline scenario or any of the three operational scenarios) with the slowest dynamics.

The PTM results submitted on April 2, 2012 (page 15 of Attachment 1) show that 50% of inserted particles were resolved at 55 days in Scenario A (compared to 50, 49, and 38 days in Scenarios B, C, and D, respectively). DOSS thus advises that the PTM screening criterion for these scenarios be calculated based on particle fates measured at 55 days.

Rationale: NMFS intends the PTM screening criterion to be an aggregate measure of different flow conditions under different operations scenarios. As noted in the OMR Memorandum (p. 6), "Because NMFS is using PTM to provide a representation of how

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<sup>1</sup> OMR Memorandum available at: [http://swr.nmfs.noaa.gov/ocap/2012\\_stipulation.htm](http://swr.nmfs.noaa.gov/ocap/2012_stipulation.htm)

the distribution of particles is affected by different hydrodynamics condition (*sic*), the simulation window must be long enough for particle fates to be resolved.” The blue “In Delta” line on the time series graphs in Attachment 1 (pages 5-8) represents the fraction of particles that have not yet reached one of the five “standard” PTM fates (CVP, SWP, agricultural diversion, Contra Costa diversion, past Martinez). In all but Scenario D, less than 20% of the inserted particles have reached a fate by Day 28 of the simulation. This pattern was also present in the PTM data reviewed by DOSS on March 27, 2012. DOSS discussed possible refinements to the calculation method for the PTM screening criterion at that time but deferred the decision to the April 3, 2012, DOSS call to allow DOSS members sufficient time to consider the proposed refinements.

Based on preliminary discussion on the March 27, 2012, DOSS call, and further discussion on the April 3, 2012, DOSS call, DOSS agreed to amend the calculation of the PTM screening criterion as described in the Advice above. Measuring the fraction of particles reaching some fate on the same day for all scenarios allows the PTM screening criteria to capture differences in the timing dynamics between scenarios. Measuring the fraction of particles reaching some fate on the day on which 50% of particles have reached a fate in the slowest scenario means that scenarios will be compared based on results from *at least* 50% of particles. This approach thus captures timing dynamic differences and makes comparisons based on a substantive (at least 50%) fraction of inserted particles.

Advice for OMR level: Per the process described in the OMR Memorandum, the adjusted calculation for the PTM screening criterion advised above, the adjusted rounding process as advised last week, and the data for Scenarios A-D provided by DWR in Attachment 1, DOSS advises that, from April 8 to April 14, 2012, the projects be managed to an OMR level of -2,500 cfs. The 5-day running average of OMR flow during this period shall be no more than 25% more negative than -2,500 cfs (*i.e.*, -3,125 cfs).

# **ATTACHMENT 1**

PTM data provided by DWR to DOSS on April 2, 2012

Barbara Byrne &lt;barbara.byrne@noaa.gov&gt;

**NMFS PTM Results for April 8-14 OMR Determination**

1 message

**Yamanaka, Dan** <dany@water.ca.gov>

Mon, Apr 2, 2012 at 12:26 PM

To: Barbara Byrne &lt;barbara.byrne@noaa.gov&gt;, "Ford, John M (Mike)" &lt;jmford@water.ca.gov&gt;

Cc: "Leahigh, John" &lt;leahigh@water.ca.gov&gt;, "Hinojosa, Tracy" &lt;tracyh@water.ca.gov&gt;, "Pettit, Tracy" &lt;pettit@water.ca.gov&gt;, "EKiteck@usbr.gov" &lt;EKiteck@usbr.gov&gt;, "Washburn, Thuy T" &lt;TWashburn@usbr.gov&gt;

Barb, Mike,

Attached is our report of the PTM results performed for NMFS per the "Technical Memorandum to Guide Adaptive Management of OMR during April and May 2012...". The results are to support NMFS' determination of the OMR to be imposed for April 8 through 14.

Modeling info:

1. 10,000 particles injected over a 24-hour period at both Nodes 40 and 21.
2. Although not required, forecast period was extended from 28 days to 84 days.
3. Based on our best estimate of April 8 hydrology, San Joaquin flows were assumed to be 2500 cfs.
4. Delta hydrology was kept static using the estimated April 8 hydrology for the remainder of the forecast period.

In addition, the typical DSM2 assumptions consistent with recent modeling efforts were used as follows:

1. CCFB Gates operate on a Priority 3 schedule for the entire forecast period.
2. The Delta Cross Channel gates were closed December 1, 2011.
3. Suisun Marsh salinity control flashboards and boatlock were installed October 21, 2011. Three Suisun Marsh Salinity Control Gates are tied open as of February 14, 2012
4. Sacramento River flow at Freeport is around 15,000 cfs near the beginning of the forecast period and decreases to 11,100 cfs by the end of the forecast period.

The barriers were not installed for scenario A. For scenarios B, C, and D, the following assumptions were made:

1. The Middle River ag. barrier was installed on March 16, 2012 with all culvert flap-gates tied open. The Old River at Tracy ag barrier was installed on April 1, 2012.
2. The physical Head of Old River Barrier (including 8 culverts-all tied open) was installed on April 1, 2012.

If you would like the dss file, please let me know. If you have any questions regarding the results, please contact me at [dany@water.ca.gov](mailto:dany@water.ca.gov) or at (916) 574-0456.

Thanks!

Dan

## **Dan Yamanaka**

Chief, Delta Compliance & Modeling Section

Operations Control Office

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[\(916\) 574-0456](tel:9165740456) - Office

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 **PTM\_Week\_2.pdf**  
297K

**PRELIMINARY RESULTS, SUBJECT TO REVISIONS**

# **PTM Simulation Results Using DSM2**

Prepared by:  
Delta Compliance & Modeling Section  
Operations Control Office  
Division of Operations & Maintenance

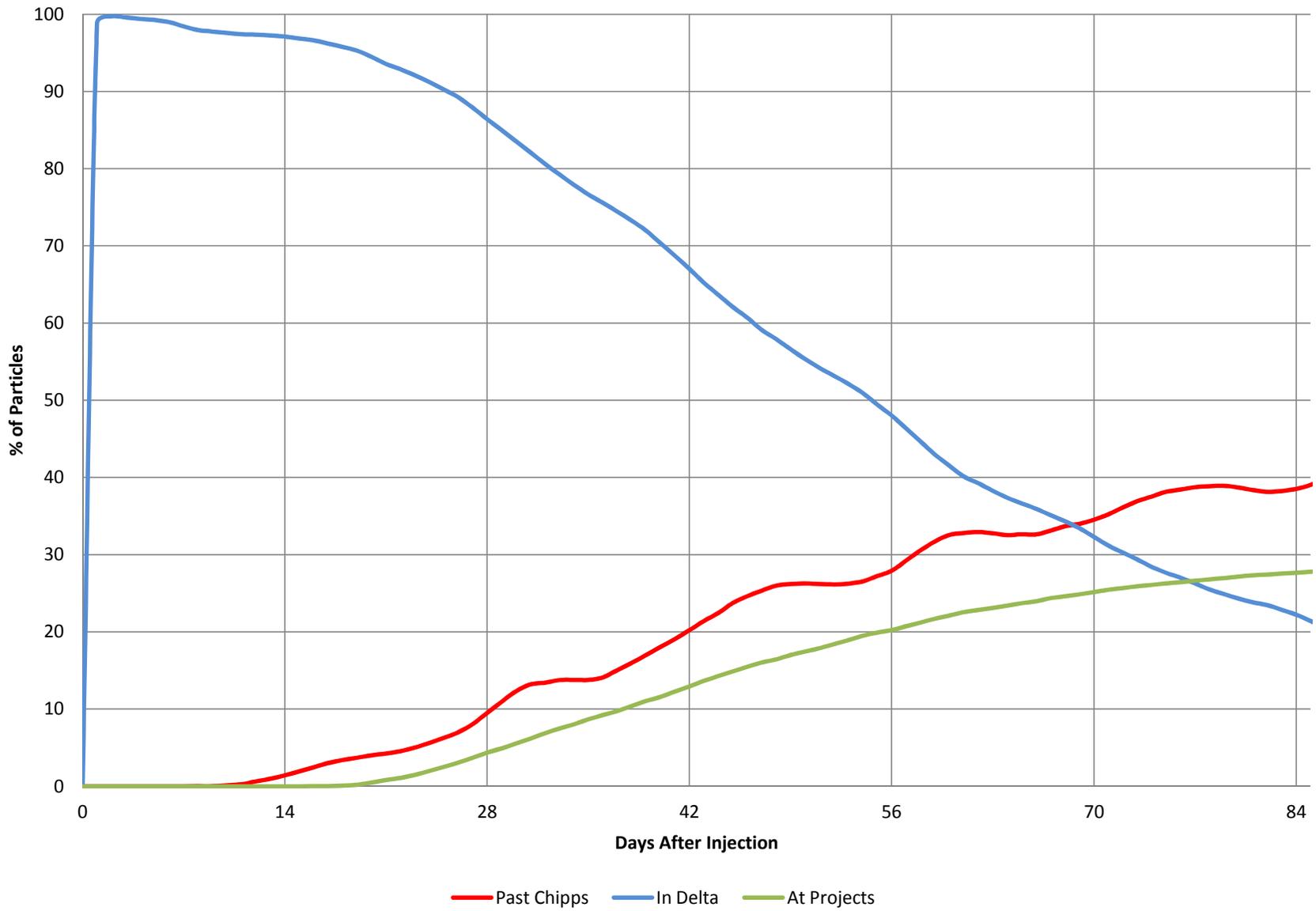
Prepared for:  
DOSS in regards to the “Technical Memorandum to Guide  
Adaptive Management of OMR during April and May 2012 for the  
Protection of listed San Joaquin Basin Steelhead”

March 30, 2012

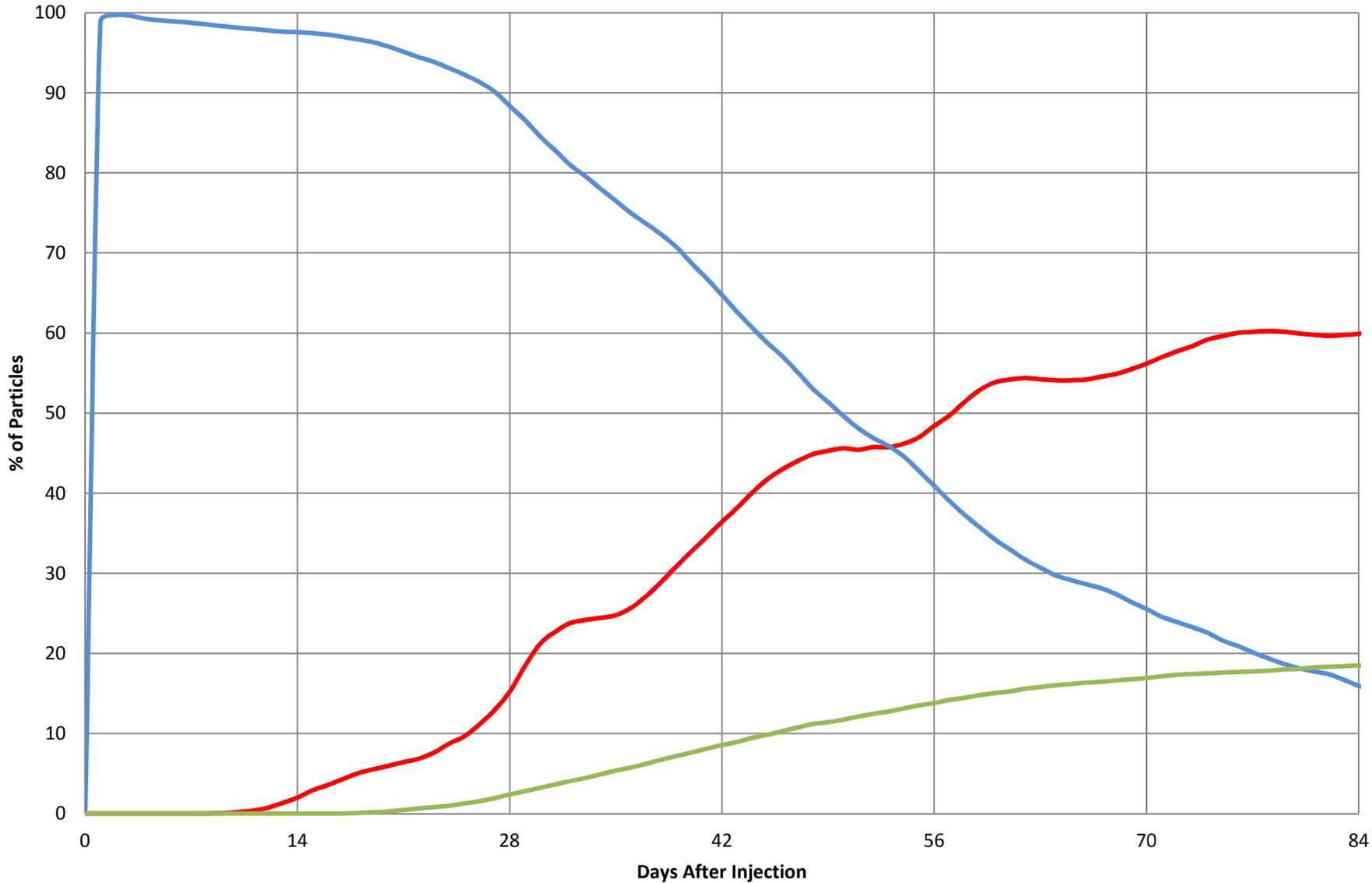
Scenario Summary Table

Scenario ID	Control	SJR at Vernalis	Combined Exports	OMR (Index)	OMR (DSM2)	HOR Barrier
A	1 to 1	2500	2500	-1438	-1588	Out
B	Min Exports	2500	1500	-1591	-1434	In
C	-2000	2500	1900	-1954	-1800	In
D	-3500	2500	3450	-3457	-3257	In

### Scenario A - Vernalis 1 to 1

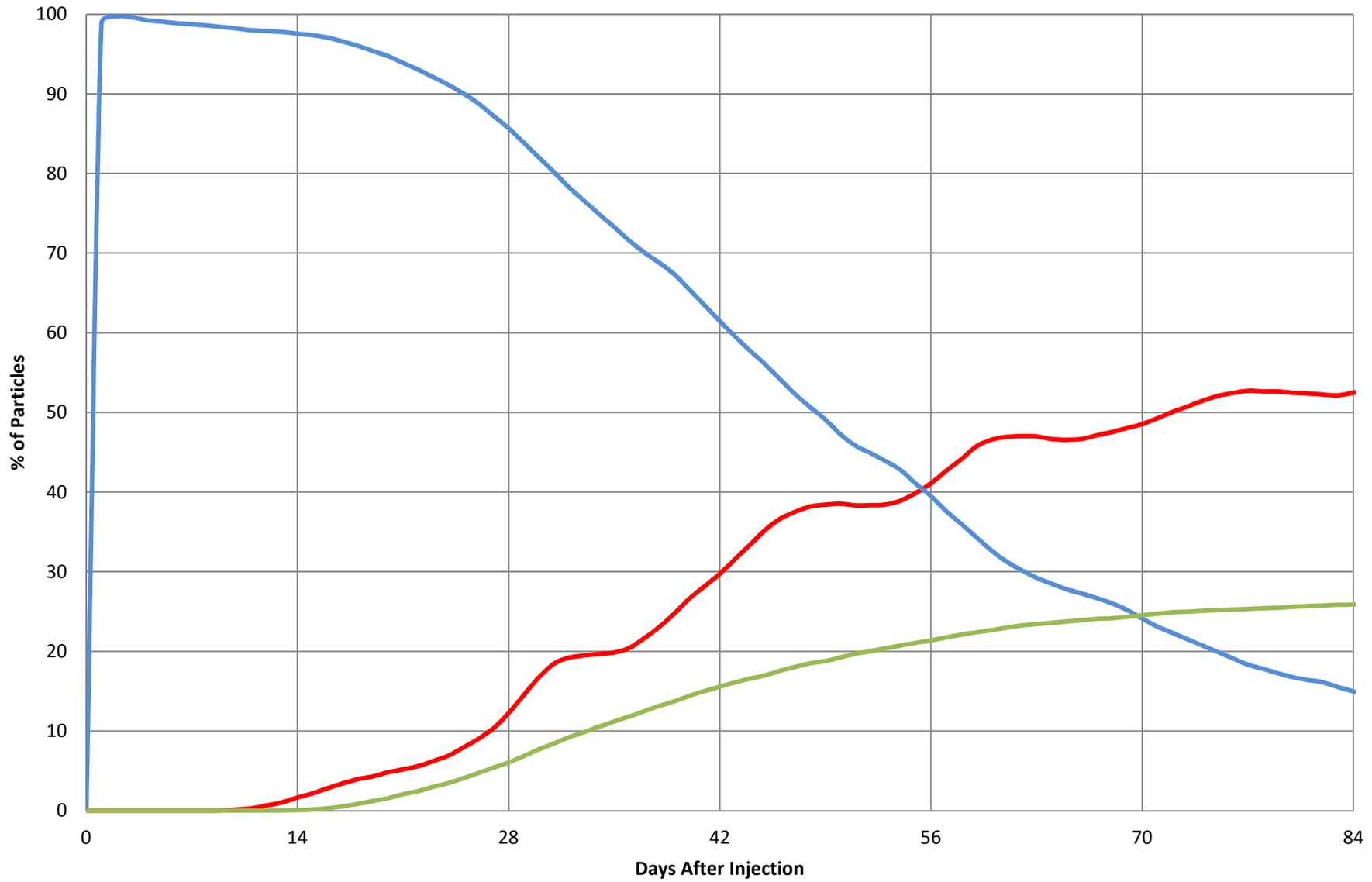


### Scenario B - Combined 1500 cfs Exports



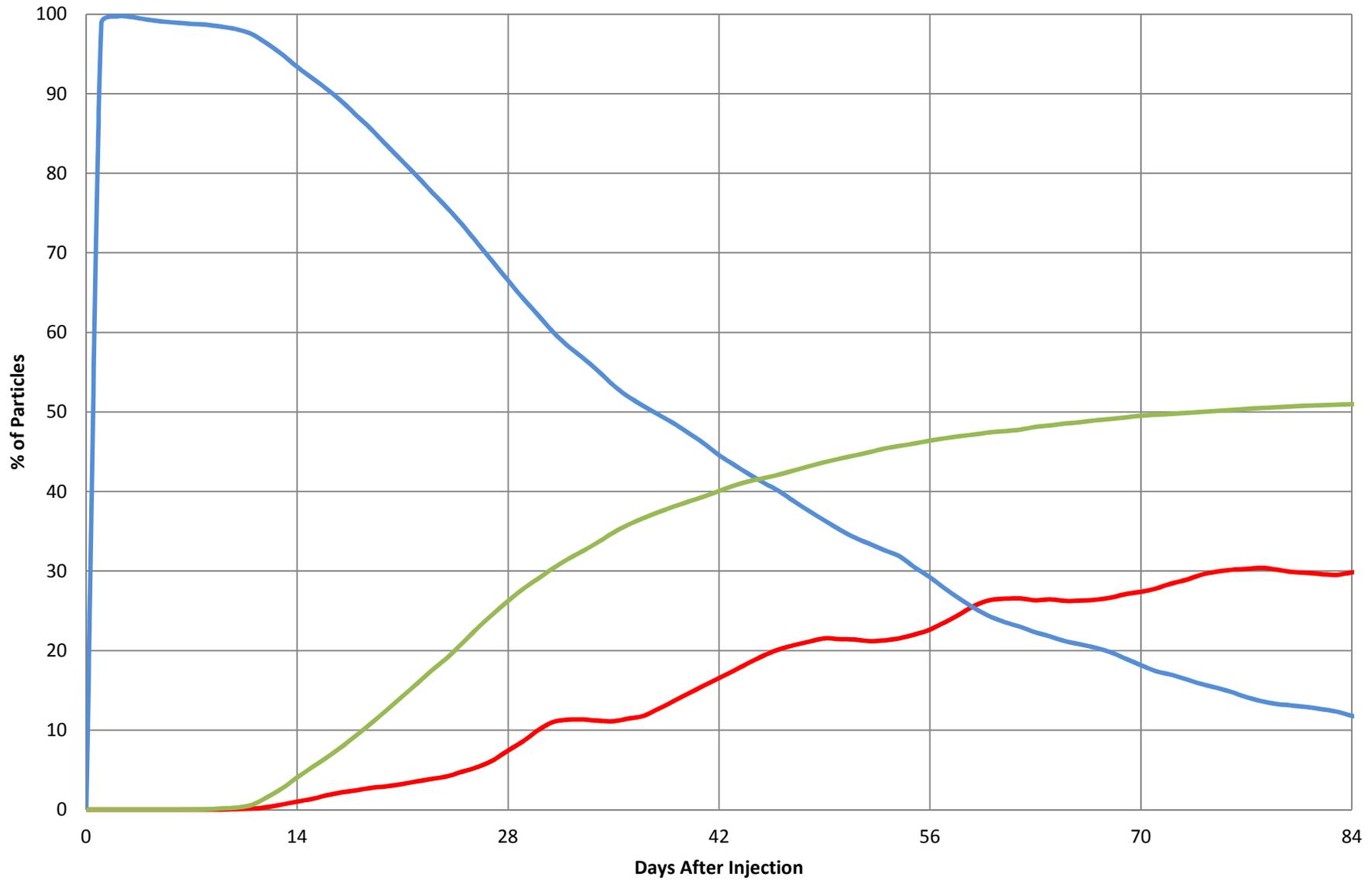
— Past Chinns — In Delta — At Proiects

### Scenario C - OMR -2000 cfs



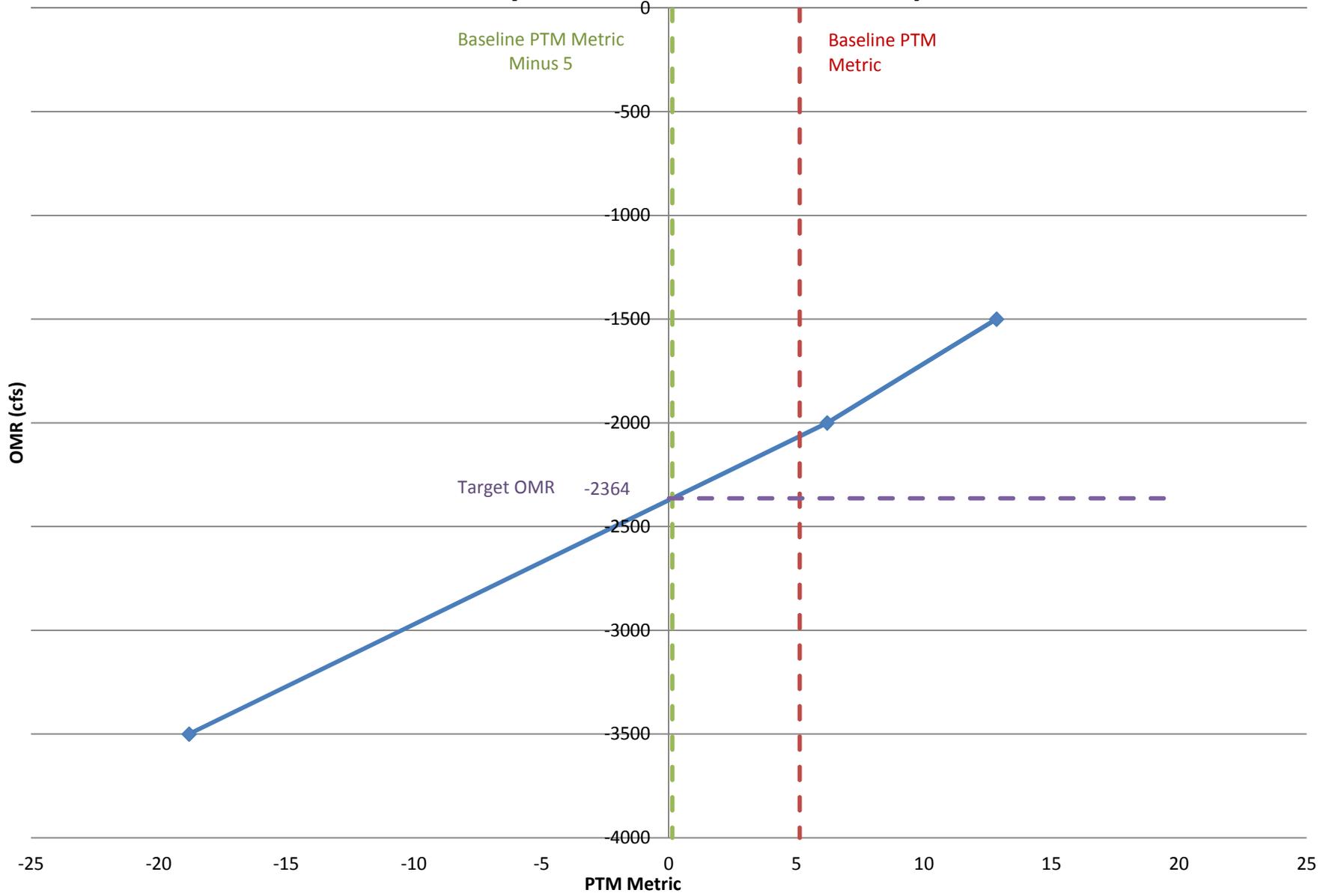
— Past Chinns — In Delta — At Proiects

### Scenario D - OMR -3500 cfs

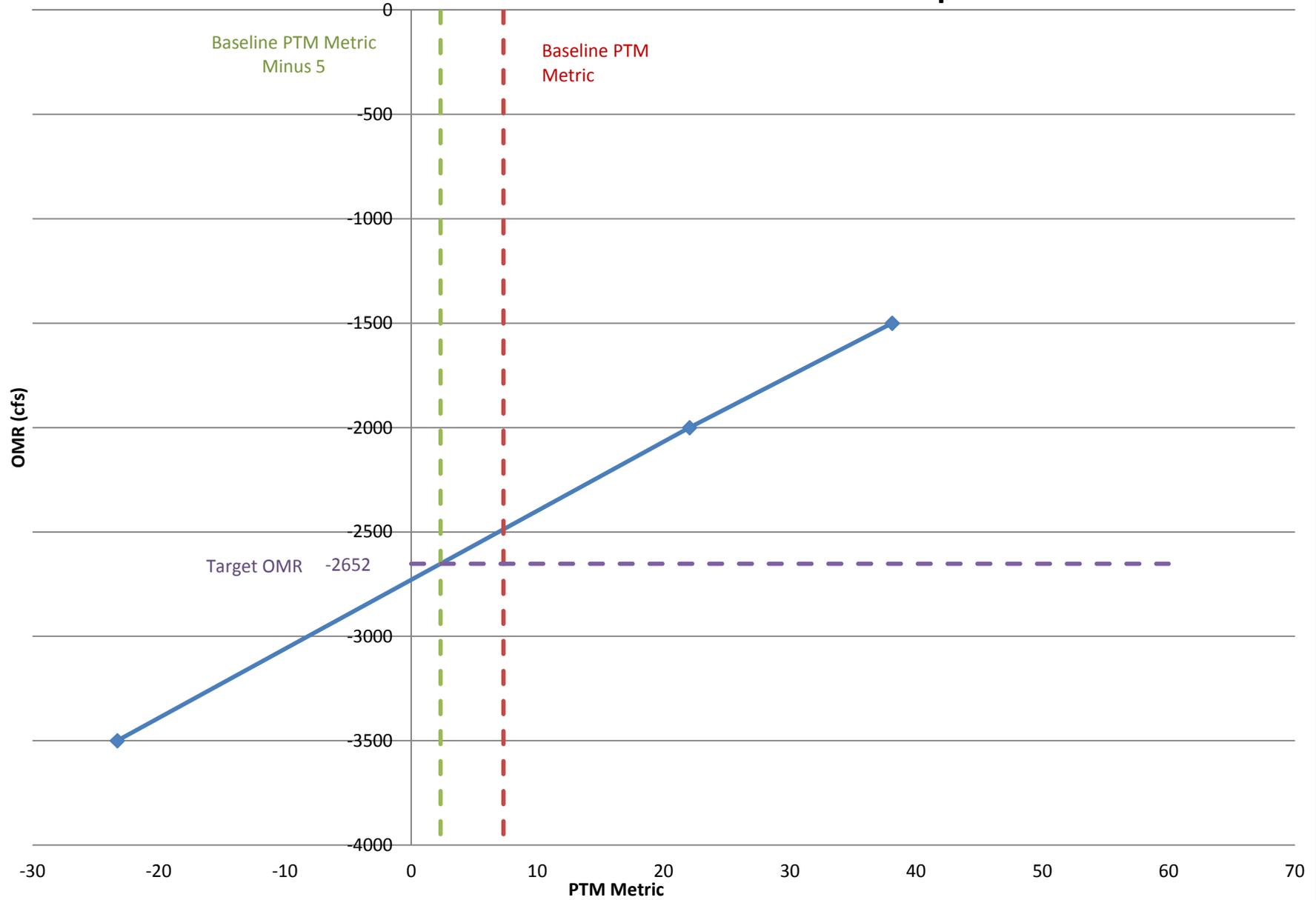


— Past Chinns — In Delta — At Proiects

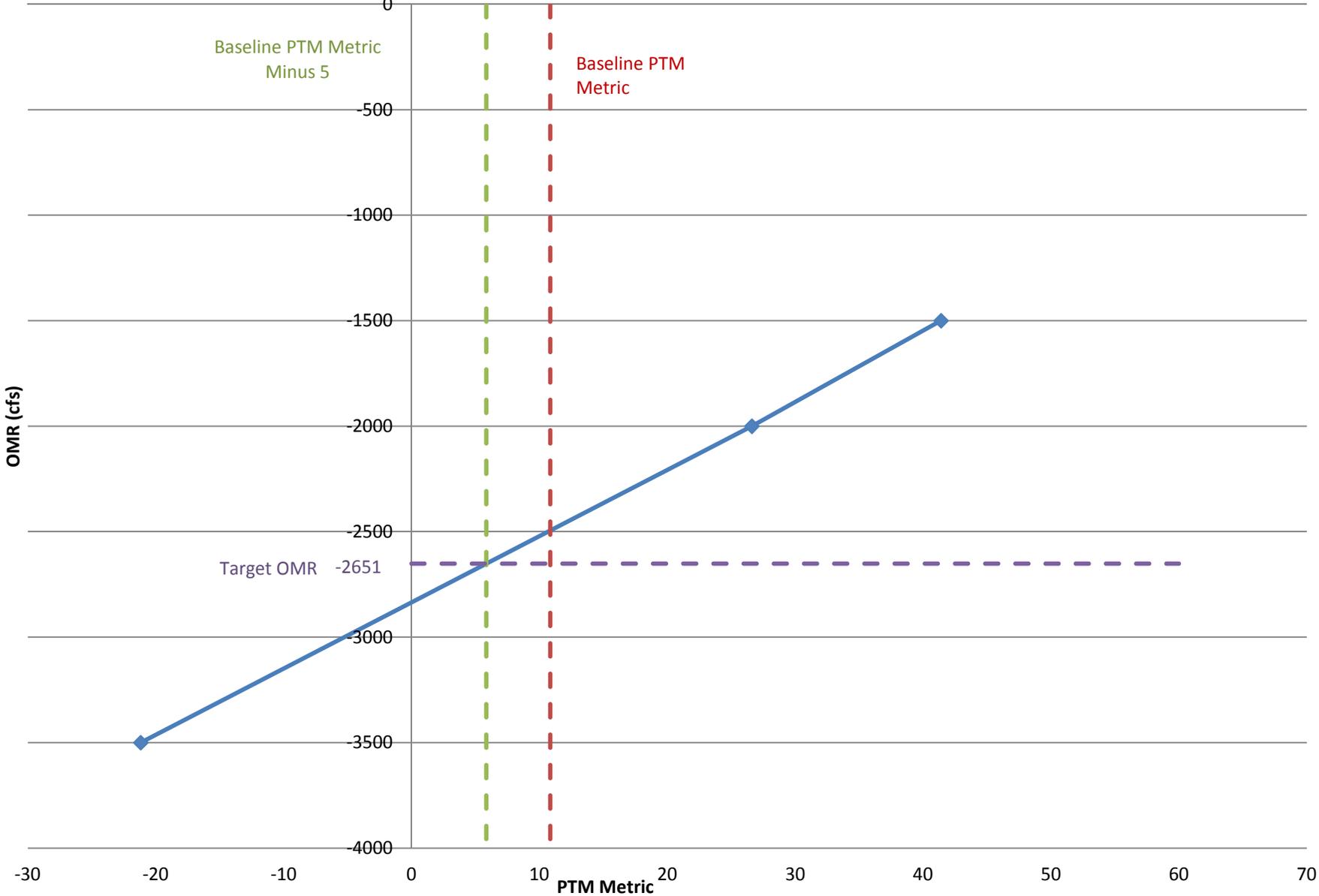
# OMR Flows and 28 Day PTM Metric with San Joaquin River at 2500 cfs



# OMR Flows and 50% Fate PTM Metric with San Joaquin River at 2500 cfs



# OMR Flows and 84 Day PTM Metric with San Joaquin River at 2500 cfs



28 Days

Scenario ID	% to CVP at 28 days	% Chipps at 28 days	% SWP at 28 days	PTM Metric at 28 days
A	1.2	9.5	3.2	5.1
B	1.6	15.2	0.8	12.8
C	3.3	12.2	2.8	6.2
D	13.4	7.4	12.8	-18.8

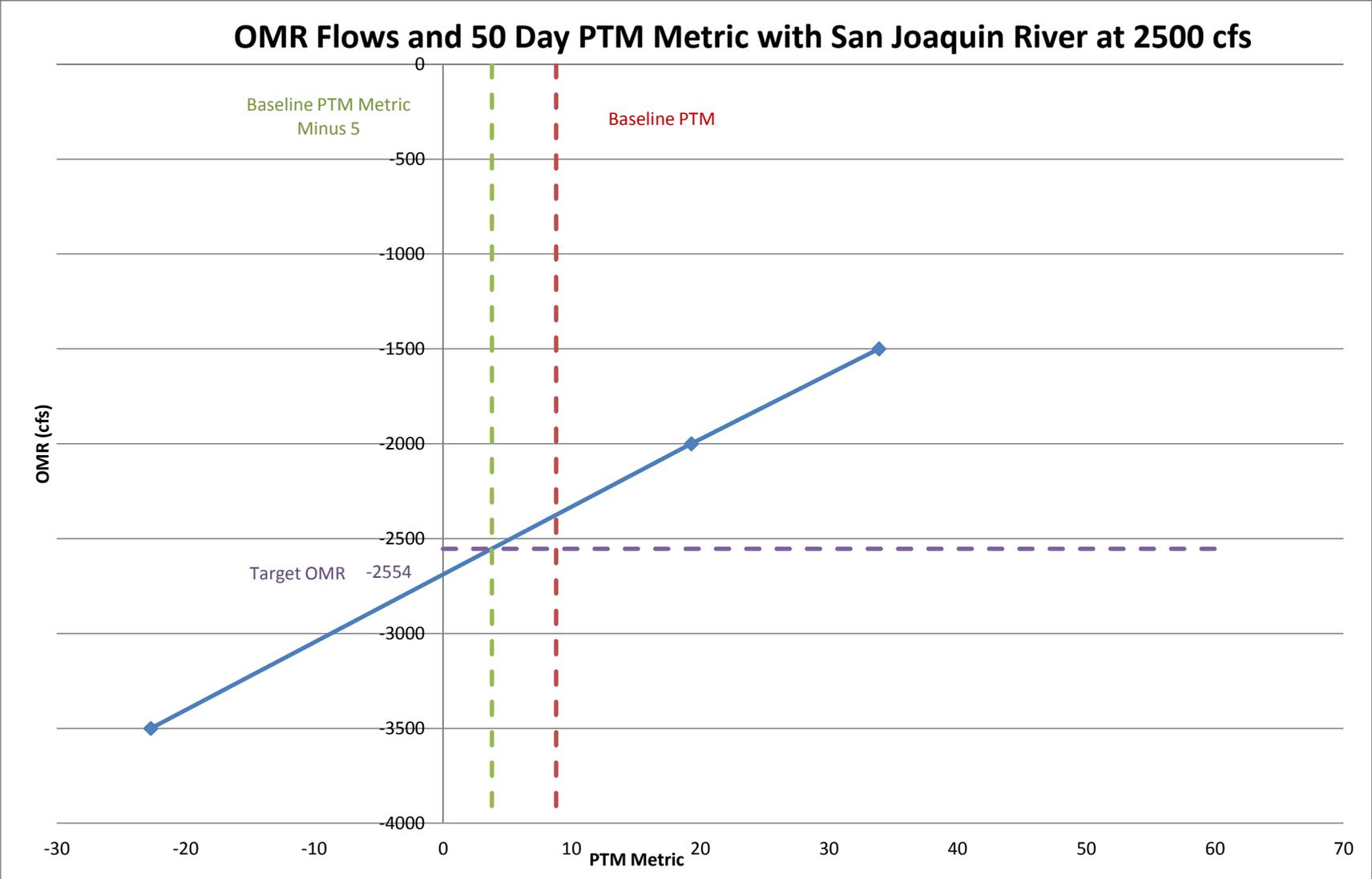
84 Days

Scenario ID	% to CVP at 84 days	% Chipps at 84 days	% SWP at 84 days	PTM Metric at 84 days
A	5.1	38.5	22.6	10.9
B	7.4	59.9	11.1	41.4
C	10.1	52.5	15.8	26.6
D	23.3	29.8	27.6	-21.2

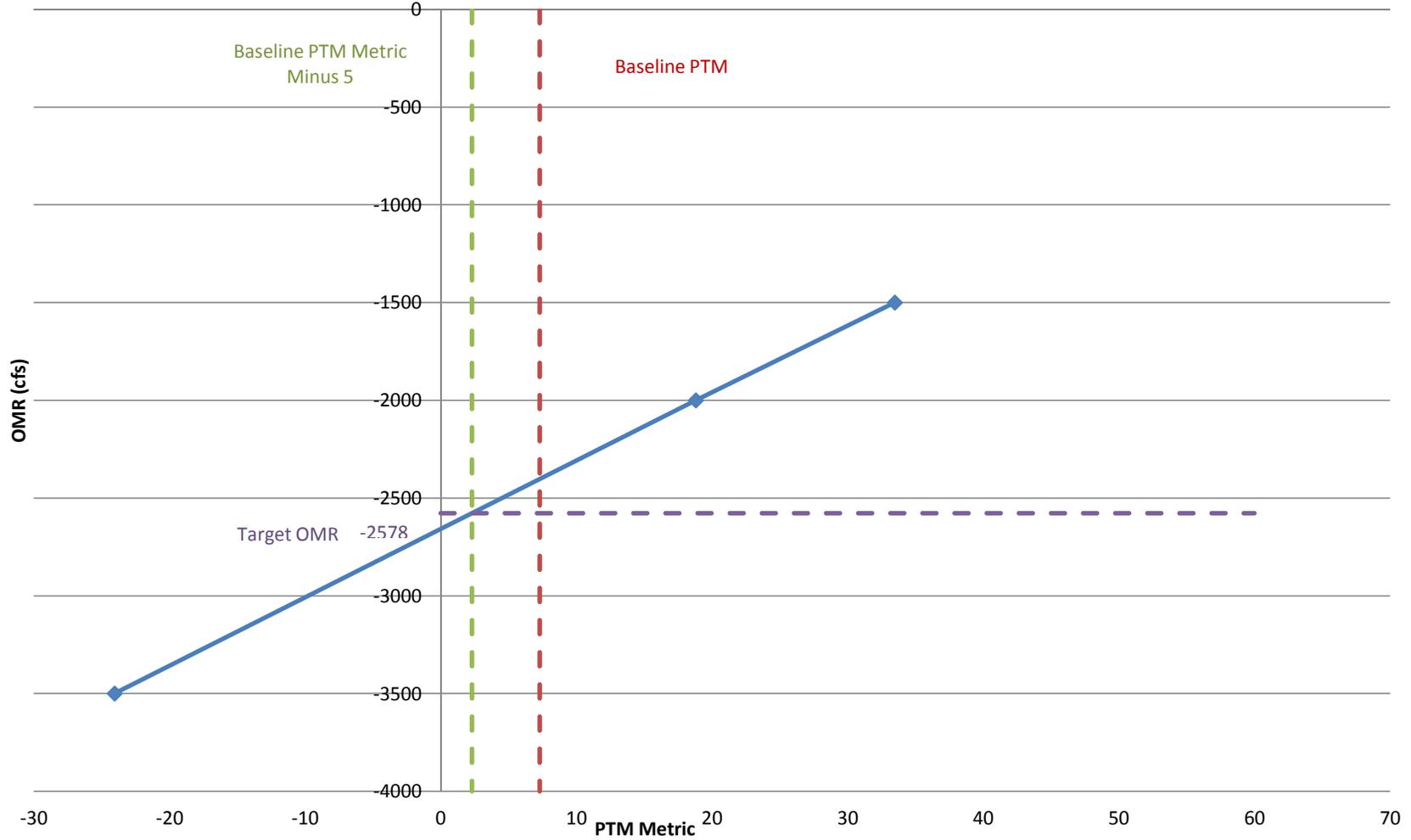
50% Particle Fate

Scenario ID	Number of Days	50% CVP	50% SWP	50% Chipps	PTM Metric
A	55	3.7	16.2	27.2	7.3
B	50	5.6	6.1	45.6	33.9
C	49	8.0	10.8	38.4	19.6
D	38	18.0	19.4	12.7	-24.7

# OMR Flows and 50 Day PTM Metric with San Joaquin River at 2500 cfs



# OMR Flows and 55 Day PTM Metric with San Joaquin River at 2500 cfs



28 Days

Scenario ID	% Chipps at 28 days	% to CVP at 28 days	% SWP at 28 days	PTM Metric at 28 days
A	9.5	1.2	3.2	5.1
B	15.2	1.6	0.8	12.8
C	12.2	3.3	2.8	6.2
D	7.4	13.4	12.8	-18.8

50 Days

Scenario ID	% Chipps at 50 days	% to CVP at 50 days	% SWP at 50 days	PTM Metric at 50 days
A	26.3	3.4	14.1	8.8
B	45.6	5.6	6.1	33.9
C	38.5	8.1	11.1	19.3
D	21.4	20.7	23.5	-22.7

55 Days

Scenario ID	% Chipps at 55 days	% to CVP at 55 days	% SWP at 55 days	PTM Metric at 55 days
A	27.2	3.7	16.2	7.3
B	47.0	6.1	7.4	33.5
C	39.9	8.6	12.4	18.8
D	22.0	21.4	24.7	-24.0

84 Days

Scenario ID	% Chipps at 84 days	% to CVP at 84 days	% SWP at 84 days	PTM Metric at 84 days
A	38.5	5.1	22.6	10.9
B	59.9	7.4	11.1	41.4
C	52.5	10.1	15.8	26.6
D	29.8	23.3	27.6	-21.2

50% Particle Fate

Scenario ID	Number of Days	50% Chipps	50% CVP	50% SWP	PTM Metric
A	55	27.2	3.7	16.2	7.3
B	50	45.6	5.6	6.1	33.9
C	49	38.4	8.0	10.8	19.6
D	38	12.7	18.0	19.4	-24.7