

***Guadalupe, San Antonio, Mission, & Aransas Rivers
and Mission, Copano, Aransas, & San Antonio Bays
Basin & Bay Area Stakeholders Committee***

**Instream Flow Regime
Recommendation
Application Example**

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Flow Regime Recommendation San Antonio River @ Goliad

Overbank Flows	Qp: 23,600 cfs with Average Frequency 1 per 5 years Regressed Volume is 273,000 Duration Bound is 69											
	Qp: 10,600 cfs with Average Frequency 1 per 2 years Regressed Volume is 107,000 Duration Bound is 45											
	Qp: 7,680 cfs with Average Frequency 1 per year Regressed Volume is 73,500 Duration Bound is 38											
High Flow Pulses	Qp: 1,520 cfs with Average Frequency 1 per season Regressed Volume is 12,800 Duration Bound is 19			Qp: 3,540 cfs with Average Frequency 1 per season Regressed Volume is 30,000 Duration Bound is 24			Qp: 1,640 cfs with Average Frequency 1 per season Regressed Volume is 11,200 Duration Bound is 16			Qp: 2,320 cfs with Average Frequency 1 per season Regressed Volume is 17,600 Duration Bound is 19		
	Qp: 550 cfs with Average Frequency 2 per season Regressed Volume is 3,940 Duration Bound is 11			Qp: 1,570 cfs with Average Frequency 2 per season Regressed Volume is 11,300 Duration Bound is 16			Qp: 750 cfs with Average Frequency 2 per season Regressed Volume is 4,450 Duration Bound is 10			Qp: 780 cfs with Average Frequency 2 per season Regressed Volume is 5,070 Duration Bound is 11		
Base Flows (cfs)	290			280			220			270		
	200			180			150			200		
	140			130			120			130		
Subsistence Flows (cfs)	76			60			54			66		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	Winter			Spring			Summer			Fall		

Wet
Avg
Dry

Flow Levels	High (75th %ile)
	Medium (50th %ile)
	Low (25th %ile)
	Subsistence

- Notes:
1. Period of Record used : 1/1/1940 to 12/31/1969.
 2. Volumes are in acre-feet and durations are in days.

Hydrologic Conditions

- 1) Use 12-month cumulative flow volumes to define seasonal hydrologic conditions with the understanding that these volumes will be selected such that dry, average, and wet conditions will apply 25%, 50%, and 25% of the time, respectively.**
- 2) Use of 12-month cumulative flow volumes will provide adequate recognition of the persistence of drought and avoid more complex antecedent seasonal computations associated with shorter durations.**
- 3) Hydrologic conditions only apply when flow is less than the 2/season peak or all pulse recommendations have been satisfied.**

Instream Flow Regime Recommendation Application Example

Flow Regime



Permit Conditions

Nomenclature

Q = Inflow (varies daily)

S = Subsistence Flow (varies w/ season)

B = Base Flow (varies w/ season & hydrologic condition)

P_i = Pulse Flow (varies w/ season & applicable tier)*

** Five tiers of pulses (2/season, 1/season, 1/year, 1/2–years, and/or 1/5–years) are potentially applicable in a season.*

Dry Hydrologic Condition Base Flow Application Example

Situation

- a) $Q < S$
- b) $B > Q > S$
- c) $P_i > Q > B$
- d) $Q > P_i^*$

• *Hydrologic Conditions do not apply.*

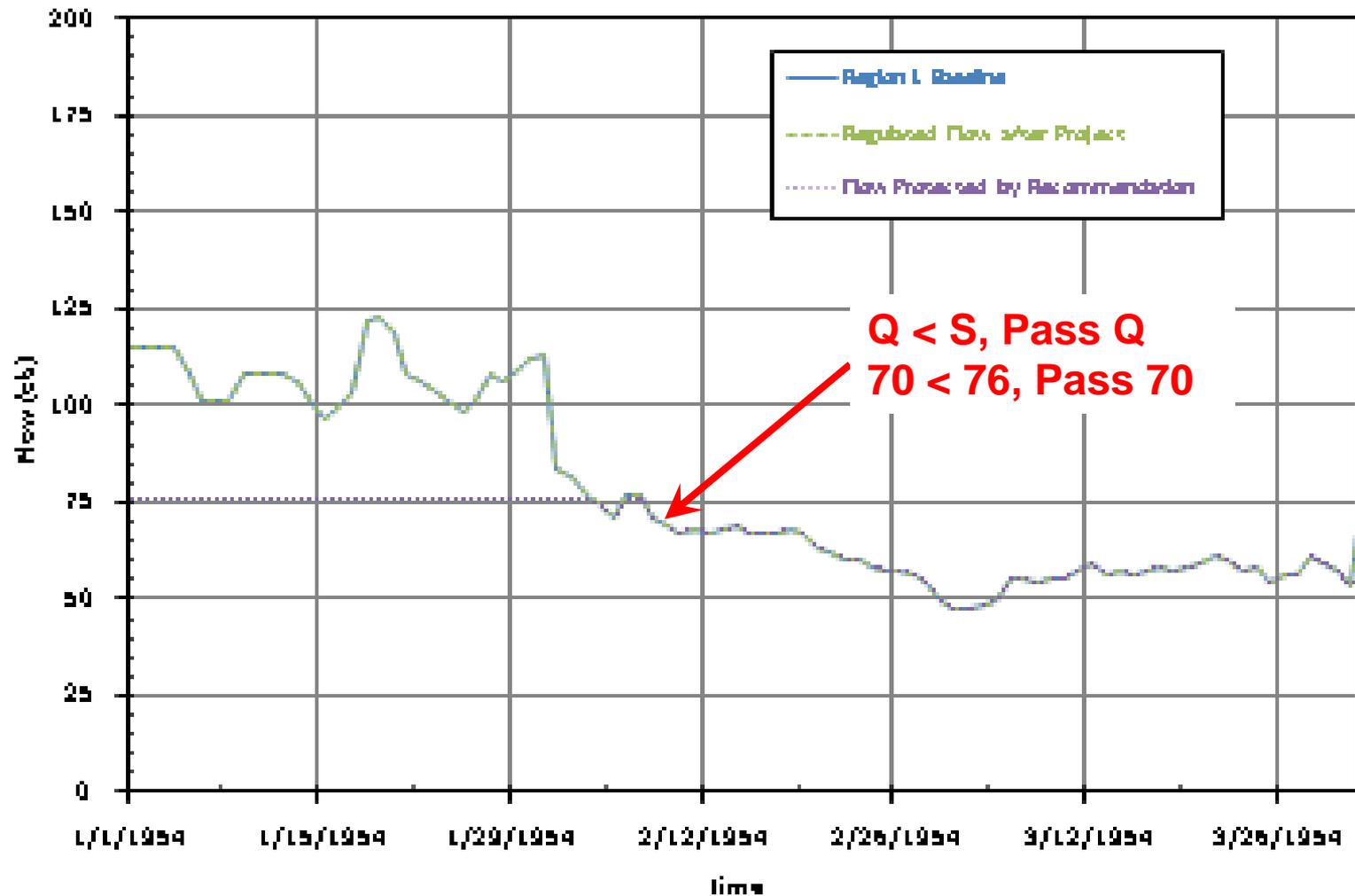
Inflow Pass-Through

- a) Q (inflow)
- b) $0.5 * (Q - S) + S$
- c) B (base flow)
- d) $\text{Min}(P_i \text{ or } Q)$ until volume or duration has passed



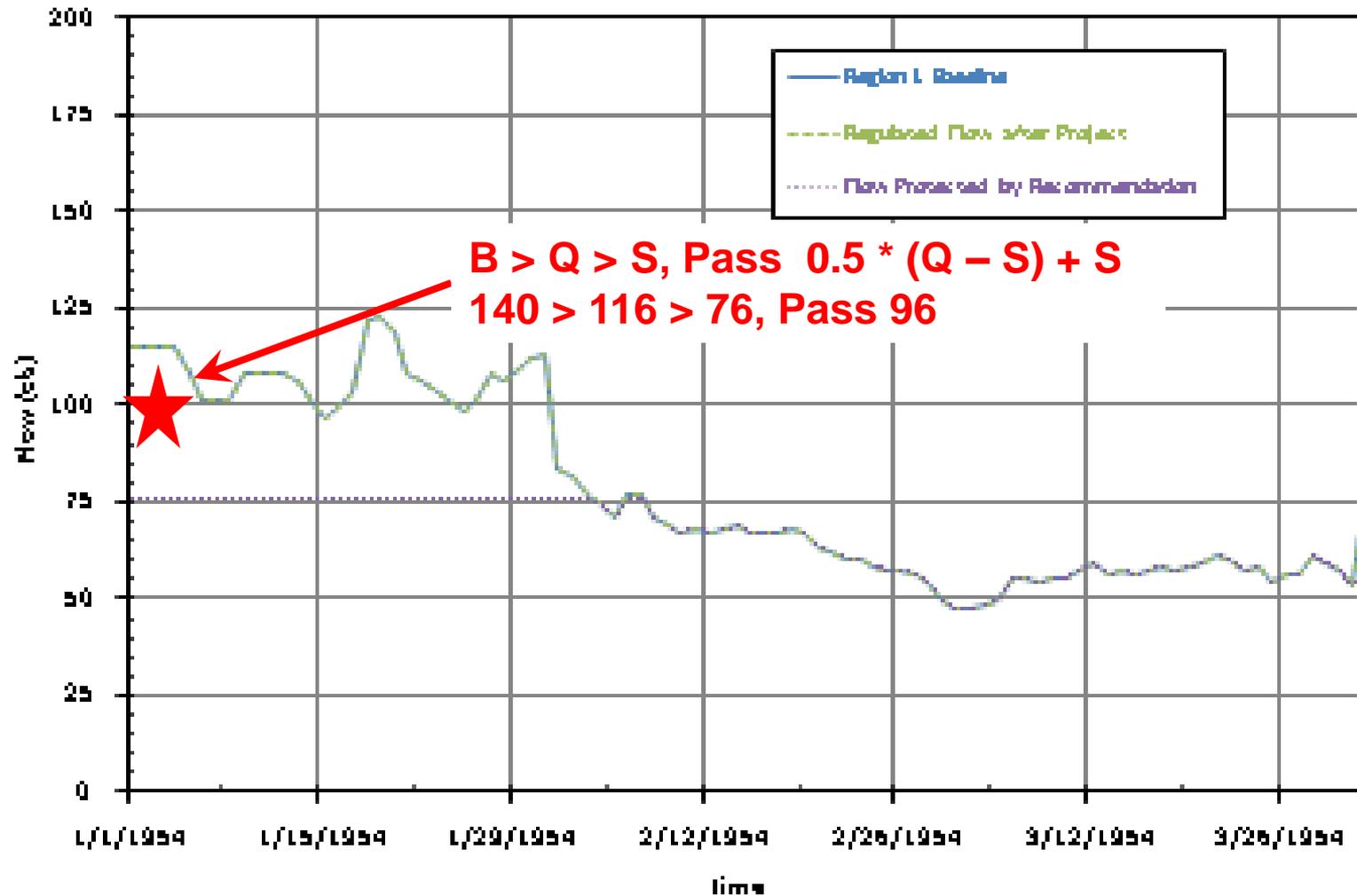
Line #1

Application Example - Dry Year



Line #2

Application Example - Dry Year



Average Hydrologic Condition Base Flow Application Example

Situation

- a) $Q < B$
- b) $P_i > Q > B$
- c) $Q > P_i^*$

•Hydrologic Conditions do not apply.

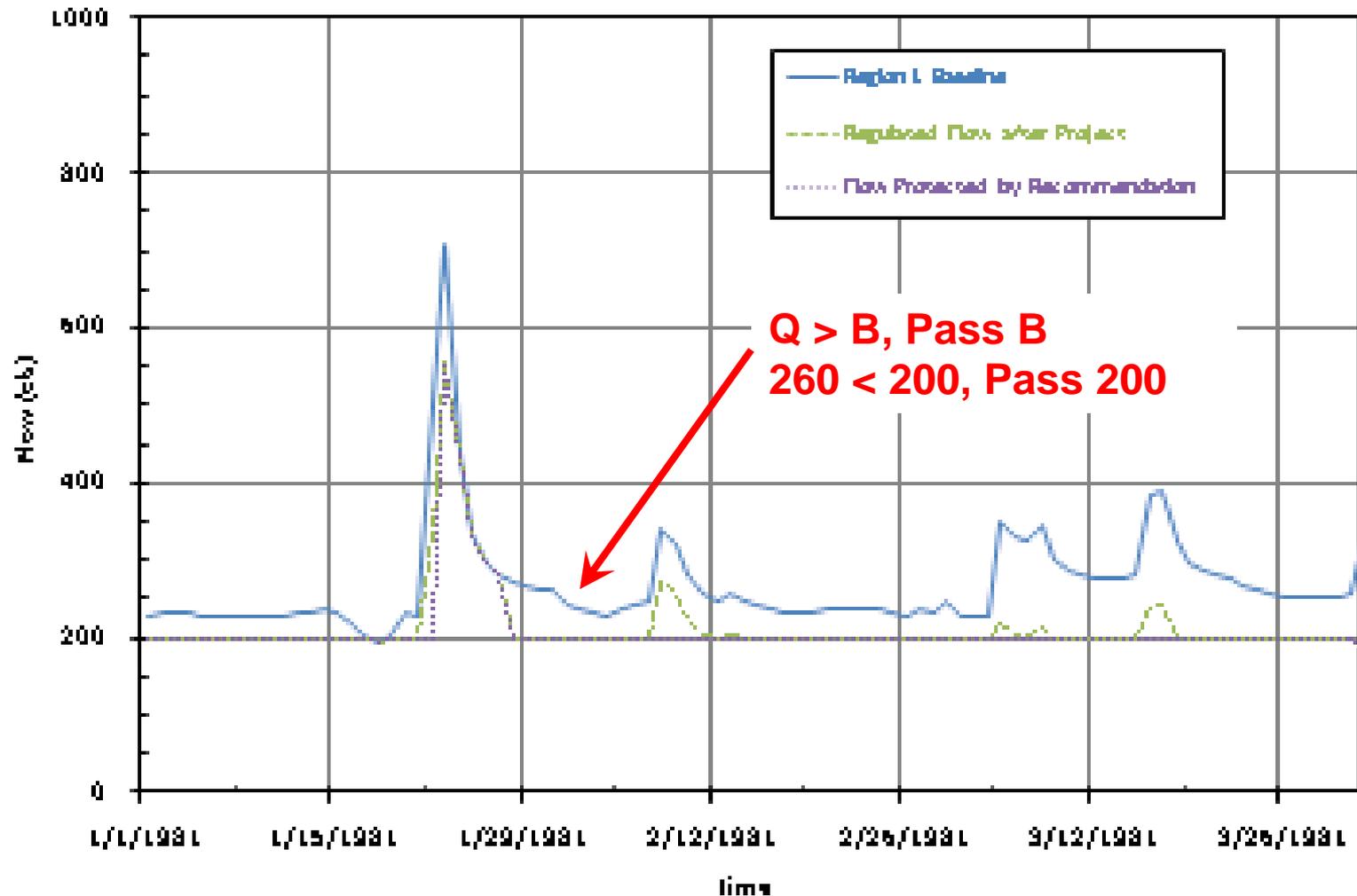
Inflow Pass-Through

- a) Q
- b) B
- c) $\text{Min}(P_i \text{ or } Q)$ until
volume or duration
pass



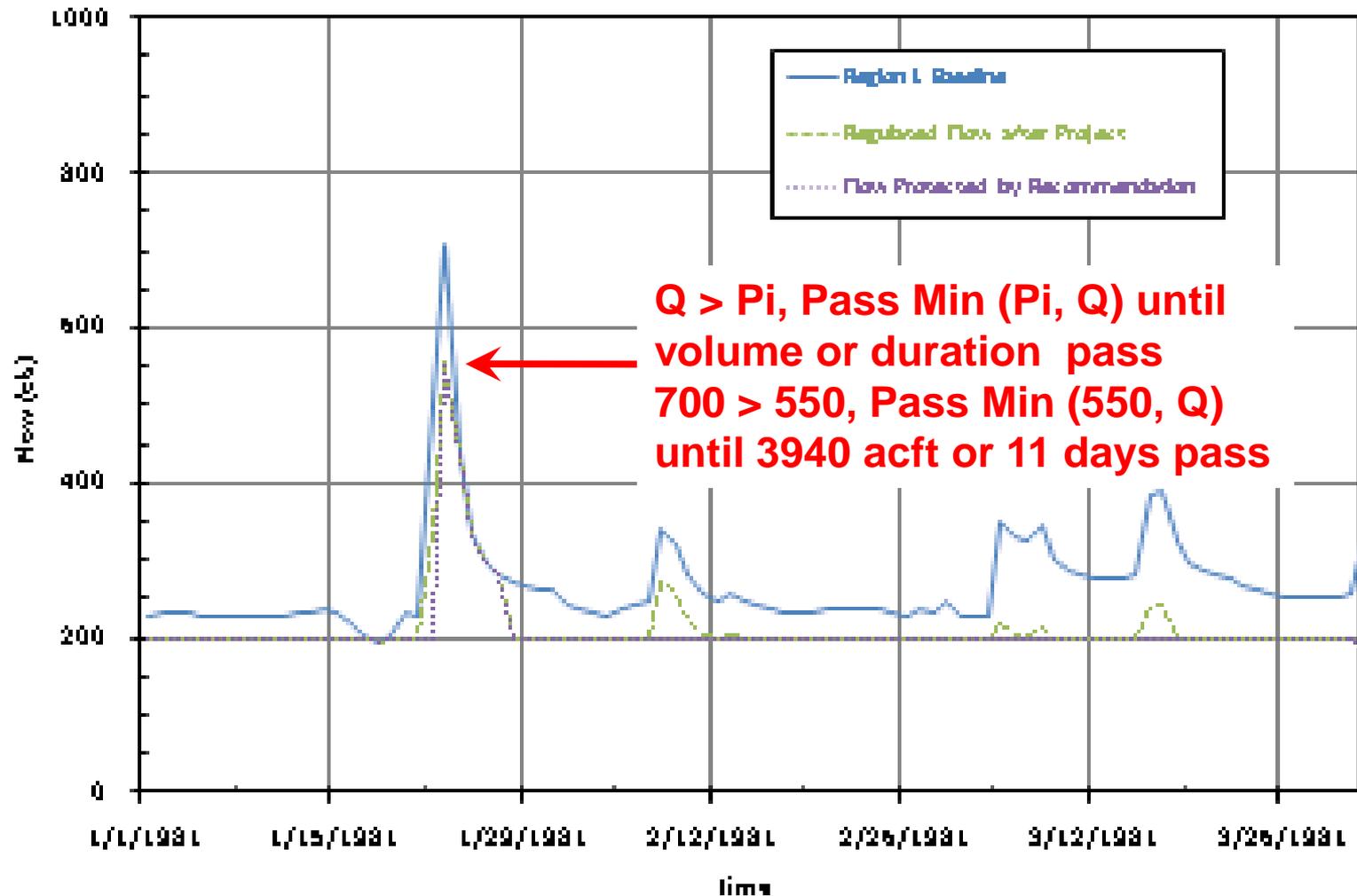
Line #10

Application Example - Average Year



Line #11

Application Example - Average Year



Wet Hydrologic Condition Base Flow Application Example

Situation

- a) $Q < B$
- b) $P_i > Q > B$
- c) $Q > P_i^*$

•Hydrologic Conditions do not apply.

Inflow Pass-Through

- a) Q
- b) B
- c) **Min (P_i or Q) until
volume or duration
pass**

