



Intake Site and Technology Selection Process and Recommendations

BDCP Caucus Meeting – January 21, 2010

California Department of Water Resources

Advancing the Bay Delta Conservation Plan
Delta Habitat Conservation & Conveyance Program



DHCCP Team



Intake Site Development Process

**BDCP Fish Facilities Technical
Team**



DHCCP Value Planning Study



**BDCP Environmental Coordination
Team Workshops**



**DHCCP Consultant Team Intake
Site and Technology
Recommendations**

BDCP Fish Facilities Technical Team

Participants: DWR, USBR, FWS, NMFS, DFG, PREs, NGOs, BDCP and DHCCP Consultants

Mission: Identify reliable and biologically protective diversion technologies and candidate intake locations/configurations between Sacramento and Walnut Grove for up to 15,000cfs

Conclusions:

Technologies

- Behavioral/experimental technologies (not suitable as a standalone technology, but potentially useful as compliment to positive barrier fish screens)
- Other ~ louvers/infiltration galleries (rejected)
- On-channel, positive barrier fish screens for entrainment prevention of juvenile to adult life stages (recommended)
- Intake technologies identified by FFTT:
 1. On-Bank
 2. In-River
 3. Cylindrical

Capacity and Configuration

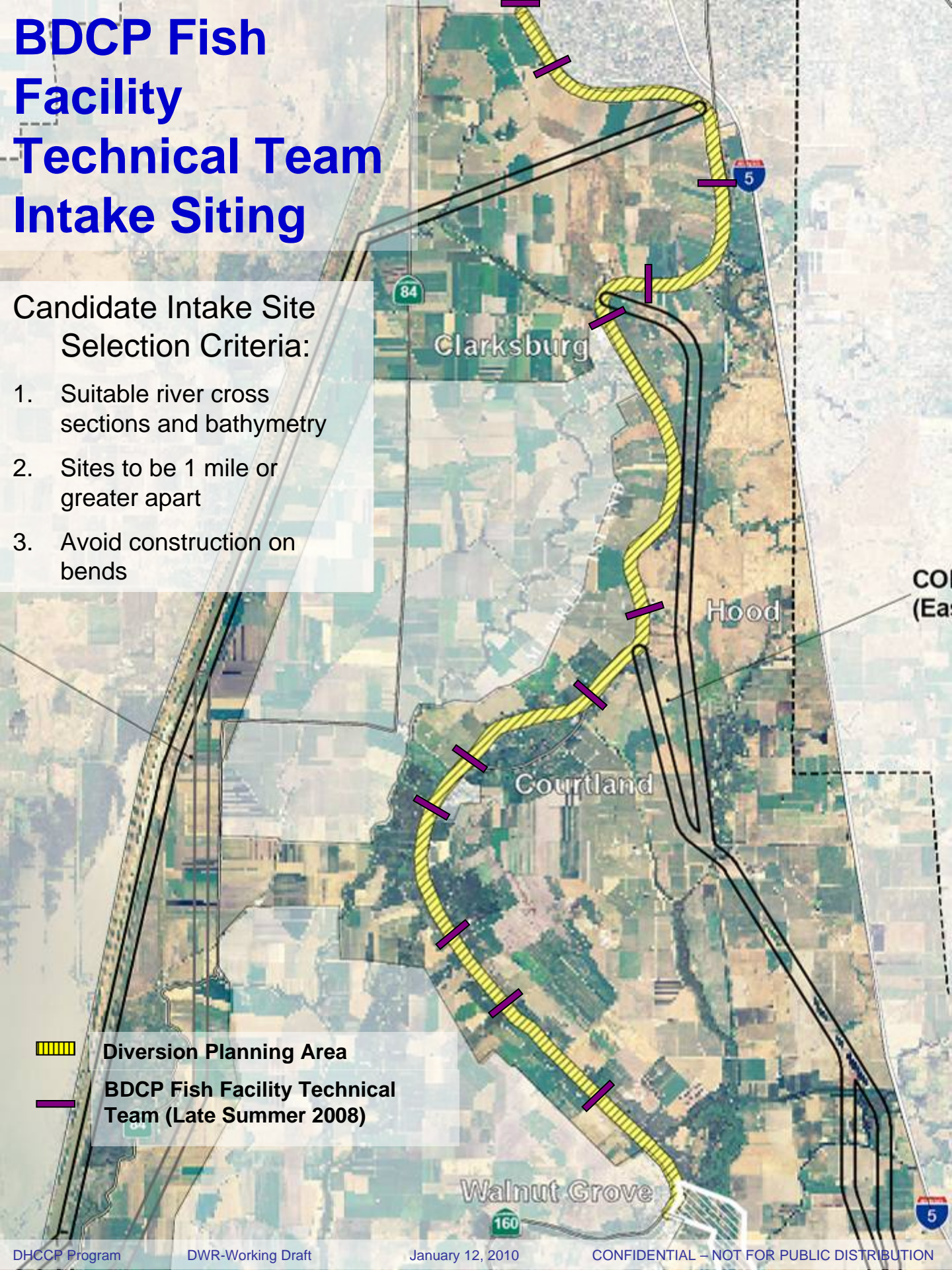
- 3 to 10 intakes - 1,500cfs to 5,000cfs per intake
- Mixed technologies, capacity/size may vary
- Design to salmonid criteria (0.33fps approach velocity) and operate to smelt criteria when present
- Intakes isolatable and accessible for O&M, minimize fish exposure time, sediment/debris load, flood impacts, predation.

BDCP Fish Facility Technical Team Intake Siting

Candidate Intake Site Selection Criteria:

- 1. Suitable river cross sections and bathymetry
- 2. Sites to be 1 mile or greater apart
- 3. Avoid construction on bends

 Diversion Planning Area
 BDCP Fish Facility Technical Team (Late Summer 2008)



DHCCP Intake Value Planning Study

Participants: DWR, USBR, PREs, DHCCP Consultants

Objectives: Advance evaluation of screen technologies and candidate intake locations from BDCP FFTT sufficient to support development of Conceptual Engineering Reports

Process:

- Developed ~40 diversion schemes for comparison and ranking
- Developed 8 characteristics/factors by which to compare options
 1. Operational Flexibility
 2. Maintainability
 3. Constructability/Construction Ease
 4. Fish Protection/Fish Benefits
 5. Landowner and Community Impacts
 6. River Impacts
 7. Safety
 8. Security
- Developed relative cost estimates for options
- Developed evaluation matrix with scoring/weighting of options

Conclusions:

- One intake structure at each point of diversion
- 3,000cfs max intake capacity based on precedence in Sacramento River system
- Design and operate intakes to smelt approach velocity criteria

BDCP Environmental Coordination Team Intake Workshops

Participants: DWR, USBR, DHCCP Consultants

- FWS, NMFS, and DFG participated to provide input and technical assistance, but not recommendations

Objectives: Building upon FFTT and the Value Planning Study, refine intake schemes for each conveyance option (east/all tunnel, west, and through delta) which avoid and minimize environmental impacts. Outcome to support DHCCP conceptual designs and EIR/EIS Public Scoping.

Process:

- Refined intake locations using aerial and ground photography and GIS tools to avoid and minimize impacts to resources
- Performed option comparisons using the Value Planning Study matrix to reduce options from 40 to 8 options
- Defined three criteria to discriminate a preferred option
 1. Fish Protection
 2. Impacts to Land Use and Community
 3. Impacts to Terrestrial Species


Conclusions:


- Reduced screen technologies to In-River and On-Bank; Cylindrical had no history of similar scale application, vulnerable to debris load damage and predation rate concerns
- Eliminate options with intakes greater than 3,000cfs
- Identified intake options to advance for Public Scoping and CERs


BECT Intake Workshop Siting Results

Candidate Intake Site Selection Criteria:

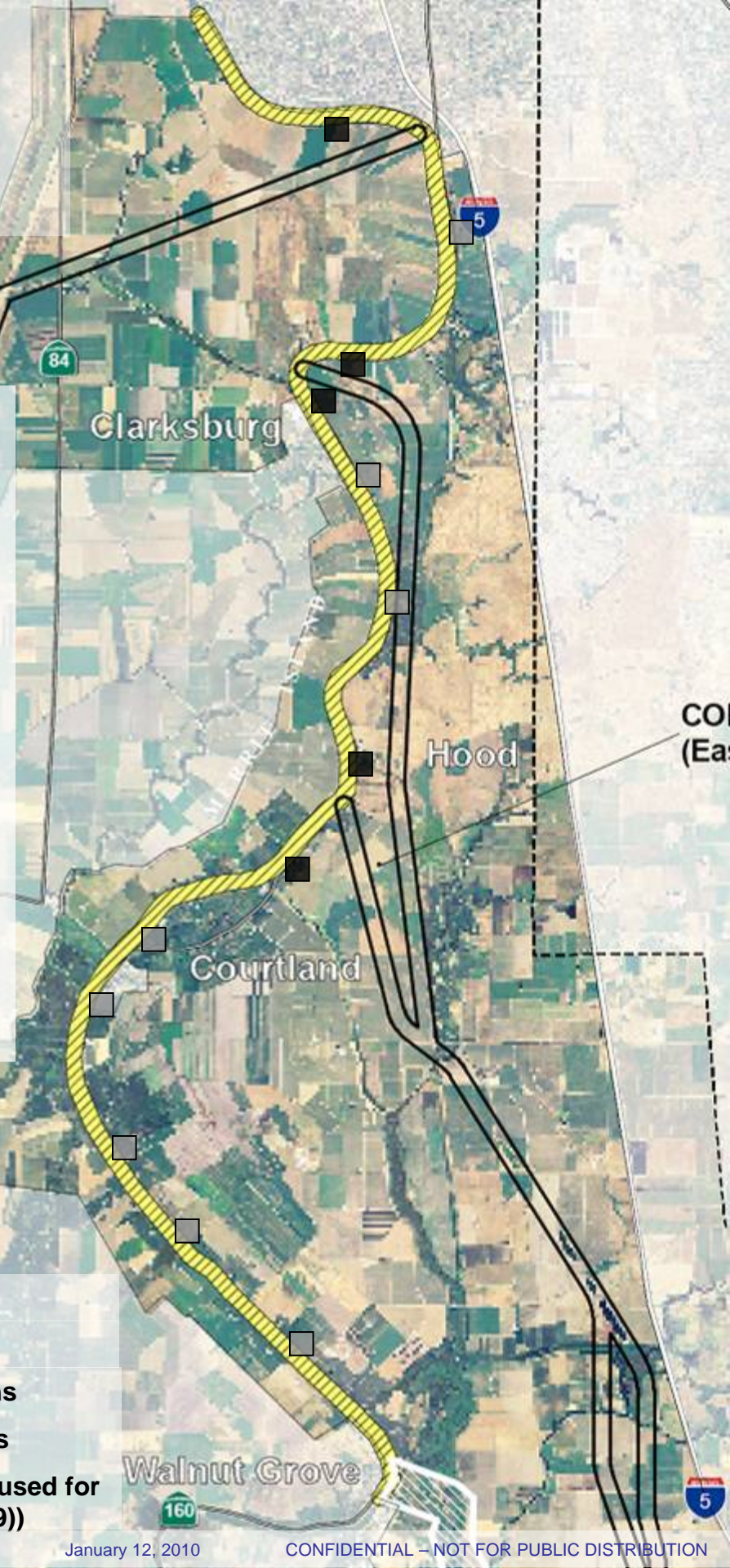
1. General preference for upstream locations for improved biological avoidance for smelt
2. Avoidance and minimization of impacts to:
 - higher value habitat and terrestrial species,
 - cultural and historical sites
 - housing and other urban land uses

 **Diversion Planning Area**

 **Proposed Intake Locations**

 **Alternate Intake Locations**

(locations for east canal used for Public Scoping (Mar 2009))



Rationale for Upstream Preference for Intake Locations

Smelt Distribution Data:

DFG Smelt and Striped Bass Larval Surveys 1991-1994

Station #




Delta smelt

Longfin smelt

#76, 30, 8

#75, 28, 0

#73, 40, 7

-  Diversion Planning Area
-  Proposed Intake Locations
-  Alternate Intake Locations
- (locations for east canal used for Public Scoping (Mar 2009))

DHCCP Consultant Team Intake Site and Technical Recommendations

Participants: DWR, USBR, BDCP and DHCCP Consultants

Objectives: Complete documentation of rationale for intake locations selected and not selected for the EIR/EIS Alternative Development Report. Integrate input on intake locations received in EIR/EIS Public Scoping comments.

Conclusions:

Site Selection Criteria


- Upstream-most location that meet site suitability criteria are preferable for improved smelt distribution avoidance and reduced tidal influence on operations
- Intake separation of at least 1 mile from all major intakes on the river
- Avoid higher density population areas (consistent with Reclamation's decision on the Freeport diversion location selection and Public Scoping comments received)
- Avoid proximity to bridges and marinas and minimize other potential navigation impacts
- Locate intakes upstream of the Sutter and Steamboat sloughs to minimize potential for reverse flows in the sloughs and risk of entrainment of food base and exposure of fish produced at restoration locations downstream in the sloughs
- Preference for sites with pending levee maintenance needs


DHCCP Consultant Intake Siting Recommendations

Site Selection Criteria:

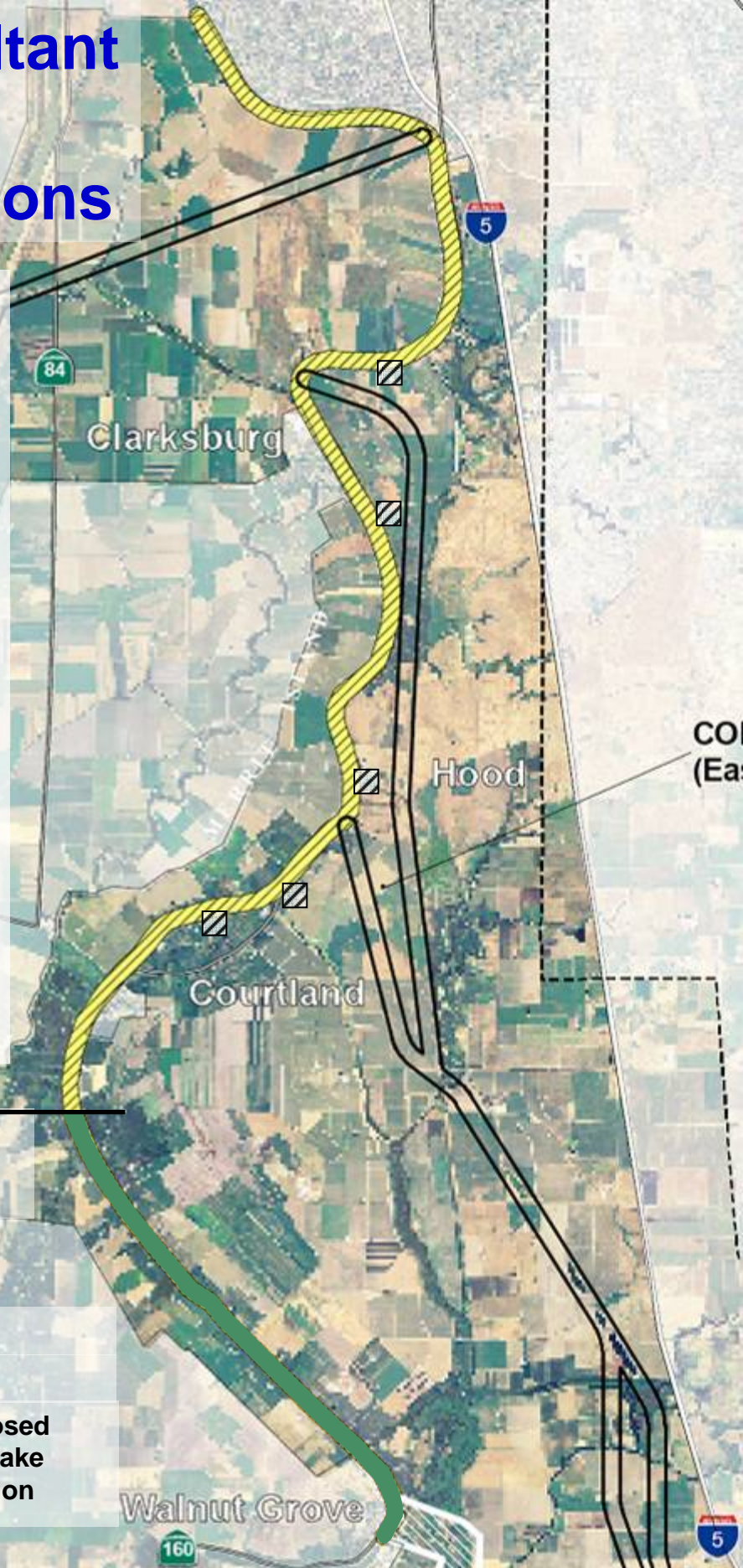
1. 5 in-river intakes at 3,000cfs capacity each
2. Avoid high population density areas
3. Upstream-most suitable locations for improved smelt avoidance
4. Upstream-most suitable locations preferred for reduced tidal influence for:
 - improved screen sweeping velocities
 - increased diversion operating periods
 - improved water quality

No Intakes South of the Confluence with Sutter Slough (June 2009)

 Diversion Planning Area

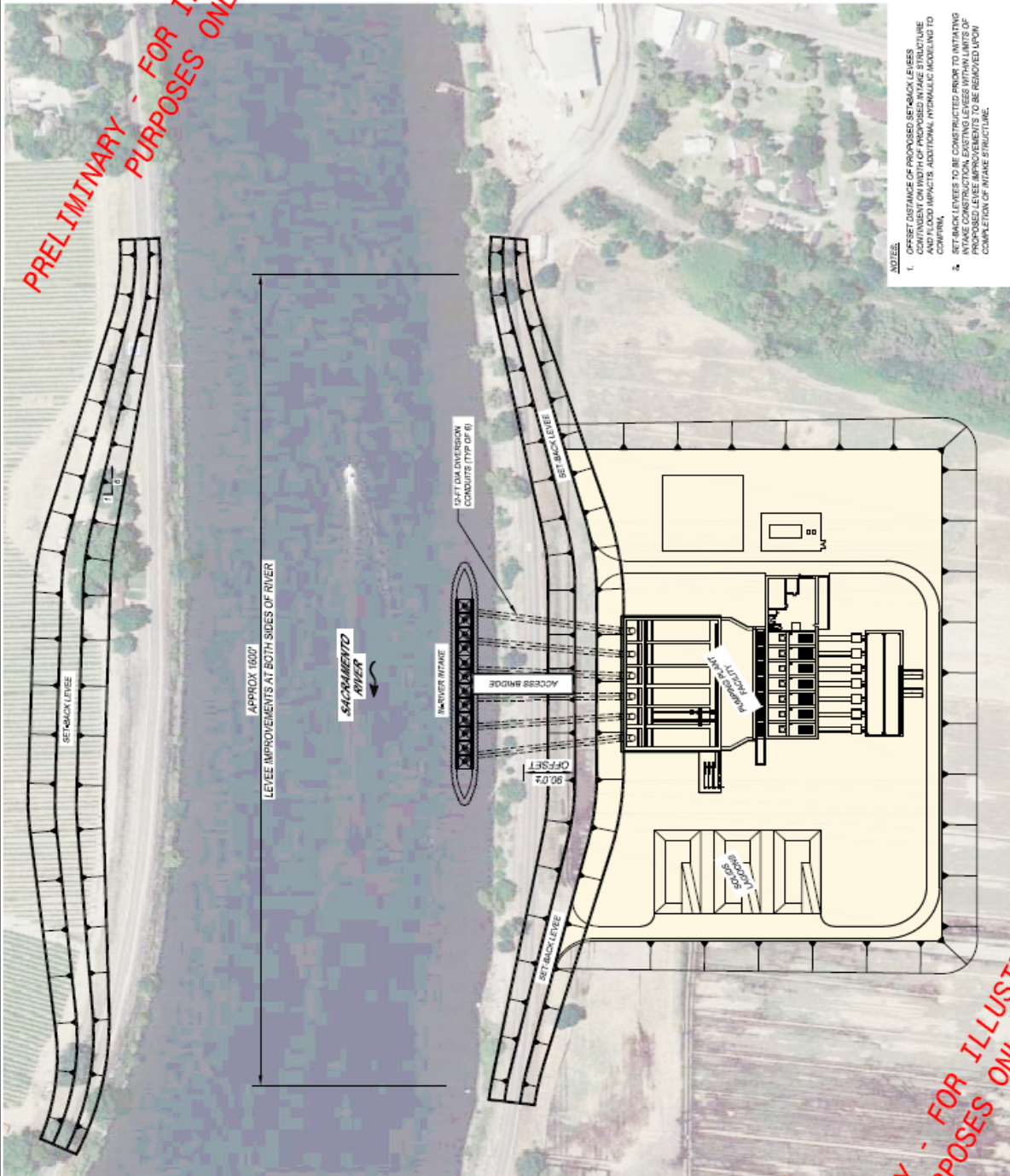
 DHCCP Consultant Proposed Project Recommended Intake Locations and Configuration

Current (Aug 2009)

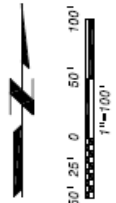


CONCEPTUAL IN-RIVER INTAKE LAYOUT

PRELIMINARY - FOR ILLUSTRATION PURPOSES ONLY



- NOTES:
1. OFFSET DISTANCE OF PROPOSED SET-BACK LEVIES CONTINGENT ON WIDTH OF PROPOSED INTAKE STRUCTURE AND FLOOD IMPACTS. ADDITIONAL HYDRAULIC MODELING TO CONFIRM.
 2. SET-BACK LEVIES TO BE CONSTRUCTED PRIOR TO INITIATING ANY CONSTRUCTION OF THE INTAKE STRUCTURE. PROPOSED LEVEE IMPROVEMENTS TO BE REMOVED UPON COMPLETION OF INTAKE STRUCTURE.



PRELIMINARY - FOR ILLUSTRATION PURPOSES ONLY

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PRELIMINARY CONCEPT DRAWING

EXAMPLE IN-RIVER INTAKE CONCEPTUAL SITE PLAN

FIGURE X

On-Going Intake Discussions with EIR/EIS Fisheries Agencies

Participants: DWR, USBR, BDCP and DHCCP Consultants

- FWS, NMFS, and DFG participating to provide input and technical assistance, but not recommendations

Objectives: Address additional intake location concerns raised by Fisheries Agencies in the mini-effects analysis and obtain input regarding intake siting for consistency with agency permitting needs.

Discussions:

Intake Location

- Consideration of Intakes located downstream of Sutter and Steamboat sloughs for biological avoidance of fish utilizing these distributaries

Intake Type

- Relative merits of In-River vs. On-Bank intake types for fish species and life stages (habitat preference for river margins and depth distribution, duration of exposure, predation)

Intake Operations

- Relative merits of a distributed intake diversion load vs. current upstream to downstream diversion operations strategy

On-Going Intake Discussions with USACE

Participants: DWR, USBR, USACE and BDCP and DHCCP
Consultants

Objectives: Determine USACE 404(b)(1) and 408 permitting
requirements and concerns

Permitting Requirement Discussions:

- Schedule
- Intake design elements to be analyzed:
 - Flood impacts and hydraulic modeling
 - Sediment transport and modeling
 - Operating rules vs. structure geometry
 - Levee integrity, stability, and seepage
 - Navigation impacts and simulation
 - River widening and other mitigation measures
 - Bio-fouling and preventatives
- Flood neutral result
- “Design to comply” approach for EIR/EIS

Intake Site and Technology Selection Process and Recommendations



Q & A