JULY 2015

# California Water Commission
# **Water Storage Investment Program**
# Stakeholder Advisory Committee Meeting



California WATER COMMISSION

# Opening

- Welcome
- Introductions
- Today's Agenda

# SAC Meeting Topics

- Common Assumptions for Project Analysis
- Net Improvements to Water Quality and Ecosystem Benefits
- Public Comment
- Conjunctive Use and Example Project Public Benefits
- Application Evaluation Process Flow Chart
- Definitions
- Next Steps and Action Items
- Public Comment

# Common Assumptions for Project Analysis

Introduction and Discussion

# Why are Common Assumptions Necessary?

- The Commission must be able to compare one project to another using the magnitude of public benefits provided by a project.
- **Use of Common Assumptions will ensure the evaluation of expected benefits and costs are consistent across projects and the results are comparable.**

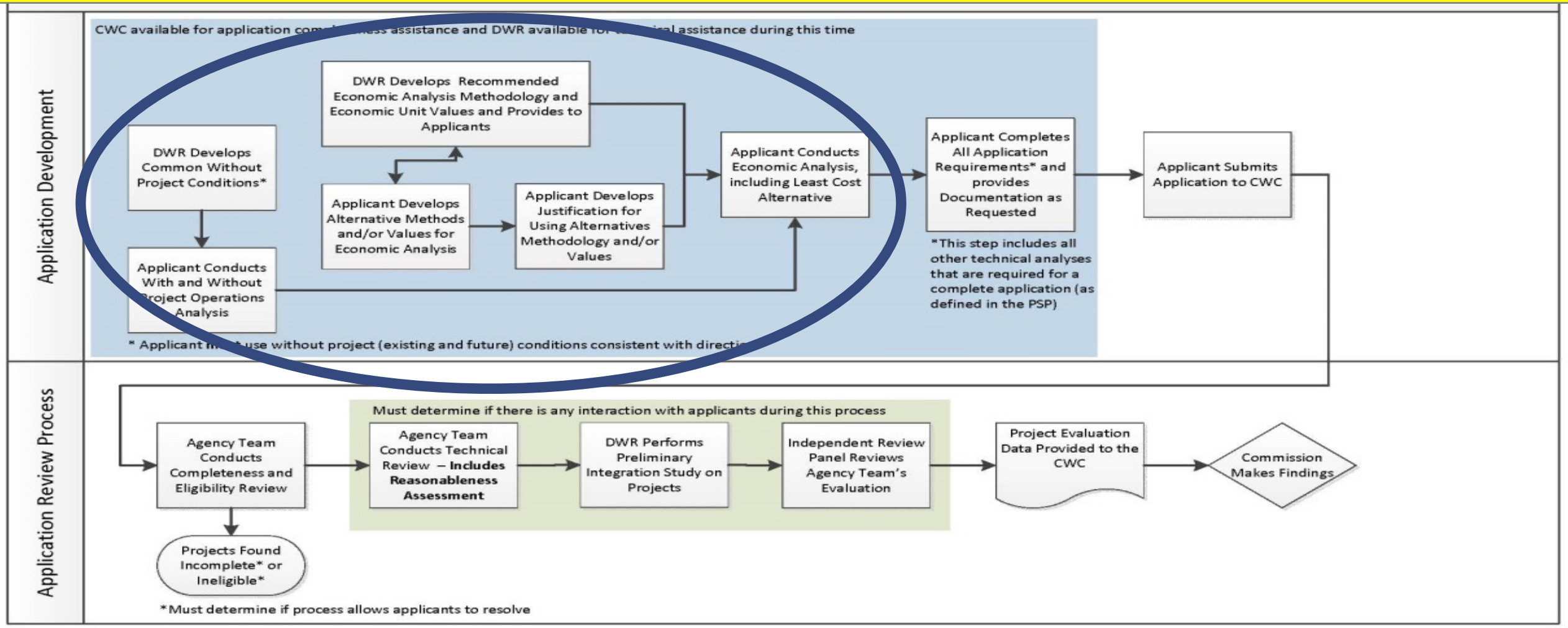
# Recap – Typical Benefits Quantification/Cost Allocation Method

1. Define future conditions without project
2. Assess future condition with project
3. **Calculate physical changes created by or caused by the project**
   a. Quantify change relative to without project
   b. Spread over the project life
4. Estimate the economic value of physical benefits
5. Compare present value of benefits and costs
6. Allocate costs to beneficiaries

# Measurement of Physical Changes

- Definition of assumptions, methods and metrics
- Used to quantify with project and without project conditions to determine
  - Expected physical changes
  - Sensitivity analysis – example climate change and sea level rise
- CEQA considerations
- Range of project types and resource evaluations
- Standard requirements and other information

# Where do Common Assumptions Fit Within the Analysis?



# Importance of Using Common Assumptions for Evaluating Projects

- Ensures project benefits and costs are comparable across projects
- Supports determination of how a storage project may improve operation of the system – also allows for comparison of potential improvements for projects with benefits in the same area
- Supports determination of “net” and “measurable” improvements
- Supports accounting of benefits and costs – ensures calculations are complete and considers all potential physical changes
- Supports assurances for providing public benefits over time

# What is the Scope of the Common Assumptions Development Effort?

- Develop appropriate **with and without project common conditions/assumptions** for determining physical changes and calculating monetized benefits and impacts
- Develop common **physical** conditions/assumptions
- Develop common **economic** conditions/assumptions

# Common Without Project Conditions/ Assumptions

- Common without project conditions/assumptions will include:
  - Hydrology and climate change
  - Surface water and groundwater operations (e.g., SWP/CVP operations)
  - Riverine conditions (e.g., geomorphology)
  - Delta conditions (e.g., hydrodynamics)
  - Surface water and groundwater quality
  - Aquatic and terrestrial resources (e.g., biology, habitat, processes, etc.)
  - Energy (e.g., hydropower, GHG emissions)
  - Recreation resources
  - Other resources, as appropriate
  - Economics

# Example Common Assumptions for Surface Water

- Assumptions
  - *include all applicable standards, permits, agreements …
  - *Delta standards if …
  - *CVP and SWP operations if …
  - Land Use and population
- Methods
  - *Geographic scope to include …
  - *Period of record to include …
  - Methods standards vs specific models
- Metrics
  - *Support determination of physical changes
  - *Support other resource evaluations
  - Project specific
- Other
  - *Disclosure of inputs, outputs, procedures

*Denotes a likely required item

# Example Common Assumptions for Aquatic Resources

- Assumptions
  - *consistent with existing decisions, authorizations and permits …
  - *Species/communities/habitats
- Methods
  - *Ecological functions an processes to include …
  - *Cumulative effect analysis to include …
  - Methods standards vs specific models
- Metrics
  - *Quantify ecosystem benefits
  - *Disclose Project-specific commitments

*Denotes a likely required item

# Example Common Assumptions for Economics

- Assumptions
  - *Discount rate (percent)
  - Unit values for water, recreation
  - Real increases in energy costs
- Methods
  - *Constant dollars (base year)
  - *Period of analysis is project-dependent
  - *Alternative cost analysis for public benefits
  - Price and cost indices for updating to base year
- Metrics
  - *Quantified public benefits
  - *Cost-effectiveness of public benefits
  - *Public and non-public cost share

*Denotes a likely required item

# Discussion for August SAC Meeting

- How flexible or prescriptive should requirements for Common Assumptions be?
- What should requirements include?
- What other information should be provided to applicants?

# Questions?

# Break

# Net Improvements to Water Quality and Ecosystem Benefits

Introduction and Discussion

# Facilitated Discussion

- How should the Commission consider unmitigatable impacts in the project evaluation process?
- How should the Commission consider existing regulatory compliance obligations in the project evaluation process?

# Public Comment

# Lunch Break

# Conjunctive Use and Example Projects Public Benefits

Discussion

# Public Benefits of Storage Projects

- Groundwater Storage and Conjunctive Use
  - Potential benefits
  - Project examples
- Surface Storage Project Examples

# Conjunctive Use: Potential Types of Ecosystem Physical Benefits

## Water supply for ecosystem improvement

- Groundwater/surface water interactions, timing and water quality
- Monetary value of physical benefit and alternative cost

## Increased stream flow or habitat acreage

- If groundwater levels are increased relative to without-project

## Percolation ponds or increased flow may have habitat value

- If water is recharged by percolation or flow

## Reduced Delta diversion or increased inflow

- If conjunctive use will replace some other supply, supply benefit limited
- Avoided ecosystem damages?

# Water Quality Improvements That Clean Up and Restore Groundwater Resources

Economic benefits from improved quality of groundwater can be monetized as a water quality public benefit

Conjunctive use projects improve aquifer water quality if

- Recharge water is better quality or extracted water is worse quality than average
- Project includes components that will clean groundwater or slow intrusion

Economic benefits may include

- Reduced costs (treatment cost or salinity damage cost)
- Increase in usable water supply

# Other Potential Conjunctive Use Benefits

## Public

Flood damage reduction
- Substitution of storage with reservoirs
- Water can be diverted during flood stage

Recreation

## Non-Public

Agricultural and M&I water supply benefit

In lieu benefit
- If SW delivered instead of groundwater, saves pumping cost

If groundwater levels increase compared to without-project
- Energy cost savings for all groundwater users
- Reduce land subsidence

# Use of Examples

- Summarize likely requested benefits information
- Provide conceptual and numerical examples
- Studies showing actual recent projects and benefits calculations for multi-purpose projects
  - Use of an example study does NOT imply endorsement of all aspects of its analysis
- Show how some actual projects' analyses compare to likely requested information for WSIP

# Potentially Proposed Benefits Information

| Requested Information | Example |
|---|---|
| The most probable without-project future | Most likely population forecast |
| Avoided costs: reduction of without-project costs | Project provides SW instead of GW: pumping cost savings |
| Targeted physical benefit: desired result | % change juvenile survival or # salmon |
| Physical action needed to obtain targeted benefit | AF water supply released for fish, degree temperature reduction |
| Monetary benefit of targeted physical | Dollar value of salmon produced |
| Alternative cost associated with physical action | Dollar cost of water supply for fish if bought by transfers, temperature control |

# Conceptual Conjunctive Use Project

- A river that is tributary to the Delta has low flow and high temperatures in critical years
- Construct groundwater pumping and/or recharge capacity
- In wet years, divert flow into recharge or in-lieu storage
- Additional diversion is mitigated by improved fish screens
- Use some of the stored groundwater instead of river diversions in critical periods
- Water users increase supply in dry years

# Assumptions Used for Numerical Examples

- Project life: 30 years
- Discount rate: 3.5%
- Unit values, including
  - $500/AF critical, $400/AF dry
  - Recreation $20/day
- Example unit values only – unit values for economic analysis have not been proposed yet

# Conceptual Conjunctive Use Project for Ecosystem and Water Supply

| Conceptual Conjunctive Use Project for Ecosystem and Water Supply | | | | |
|---|---|---|---|---|
| Critical years are 10% of years, dry years are 20% of years | | | | |
| **Project component** | **$1000 NPV Cost** | **Ann. Avg Physical Benefit** | **Annual Benefit $1000** | **NPV Benefit $1000** |
| Construct 10 new agricultural wells, 1000 gpm | $1,000 | | | |
| Operate wells in critical years, 2 months, 2,700 AF, avg 270 AFY, cost $50/AF, unit benefit $500/AF | $248 | 270 AFY | $135 | $2,483 |
| Produce an annual average of 100 more salmon annually, value $5,000 per fish | | 100 fish | $500 | $9,196 |
| Construct SW conveyance to existing GW users | $2,000 | | | |
| Provide recharge averaging 900 AF/year, net 810 AF/year after losses, $100/AF | $1,490 | | | |
| Mitigation cost, improved fish screens | $500 | | | |
| Operate wells in dry years, 2 months, 2,700 AF, avg 540 AFY, cost $50/AF, benefit $400/AF | $497 | 540 AFY | $216 | $3,973 |
| Total NPV Costs and Benefits | $5,735 | | | $6,456 |

# Some Useful Studies for Conjunctive Use

- Griebler and Avramov. 2015. Groundwater ecosystem services: a review. Freshwater Science. 34(1):355–367.
- Borchers et al. 2014. Land Subsidence from Groundwater Use in California. Water Education Foundation.
- USACE. 2002. Conjunctive Use for Flood Protection. Sacramento District. January.

# Conceptual Surface Storage Multi-purpose Project Example

- 500,000 AF reservoir in-stream
- Ecosystem, flood control, recreation, water supply benefits
- Monetary benefit of targeted species is less than alternative cost

# Conceptual Multi-Purpose Project

| Conceptual Multi-Purpose Project | | | | |
|---|---|---|---|---|
| **Project component** | **$million NPV Cost** | **Ann. Avg Physical Benefit** | **Annual Benefit $million** | **NPV Benefit $million** |
| Construct 500,000 AF reservoir | $2,000 | | | |
| Reservoir O&M costs, $1 million/year | $18 | | | |
| Produce an annual average of 2,000 more salmon annually, value $5,000 per fish | | 2,000 fish | $10 | $184 |
| Could get same temp reduction and flow benefits using transfers & mgmt, cost $20 M/yr | | 3 degree F | $20 | $368 |
| Downstream flood control benefit using EAD | | | $80 | $1,471 |
| Recreation benefit, 100,000 new visitor-days, $20/day | | | $2 | $37 |
| Provide 50,000 AF Ag/M&I, average unit value is $350/AF | $0 | 50 TAFY | $18 | $322 |
| Mitigation costs | $200 | | | |
| Total NPV Costs and Benefits | $2,218 | | | $2,382 |

# Real-World Examples

How do different methods of benefits analysis play out for real world projects? How does this compare to the potential benefits analysis methods staff have outlined for WSIP?

# Yakima Basin Integrated Plan Projects, WA

- Long analysis history
- Range of opinions regarding measurement and use of non-use values for special status salmonids
- "Economics Technical Report" (2008) applied federal NED standards, B/C ratios of 0.07 to 0.33
- "Four Accounts" study (2012)
- Non-use values of fish benefits, based mostly on survey methods, range from $3.0 to $7.1 billion PV
- "Benefit-Cost Analysis of the YBIPP" (2014) WSU team found fish benefits of $1.0 to $2.0 billion PV.
- **Shows why requested information includes benefits of physical action**
- **Fair example of how economic benefits should affect cost allocation**

# Howard Hansen Dam Water Supply and Ecosystem Restoration Project, Tacoma WA

- Includes M&I water and ecosystem (fisheries) benefits. No public access, no recreation
- M&I benefit based on cost of implementing most likely alternative
- Selection of fish features based on "cost-effective and incremental cost analysis"
- Least-cost way to "increase the likelihood of achieving the goal of self-sustaining runs"
- Most costs could be assigned based on separable costs
- **A good example for cost-effectiveness applied to physical action that achieves ecosystem physical benefits**

# Central Utah Project Completion Program

Includes many types of benefits and cost allocation

| Benefit Type | Benefits ($2004) | Share of Benefits | How Estimated |
|---|---|---|---|
| Flood Control | $1.4 | 0.9% | USACE modeling and average cost of storage |
| Irrigation | $6.5 | 4.4% | Crop budgets, net return on new irrigated lands |
| Recreation | $11.5 | 7.8% | Recreation days and value per day ($8.27) |
| Power | $7.5 | 5.1% | Alternative cost base load coal-fired power plant |
| Fish and Wildlife | $16.3 | 11.0% | Angler days and expenditure per angler day ($35.35) |
| M&I | $105.0 | 70.9% | Most likely, least cost alternative |
| Total | $148.2 | 100.0% | |

# Central Utah Project Completion Program

- Fish and wildlife benefits include use values only
- Not applicable for most special status species
- Cost allocation based on share of dedicated space and share of water supply, not economic benefits
- Recreation had neither, so no cost allocated to recreation

In summary:

- **Fish and wildlife use values would be a small share of values for special status species**
- **Use of facilities approach to cost allocation is not compliant with WSIP requirement**

# Questions?

# Break

# Application Evaluation Process Flow Chart

Update



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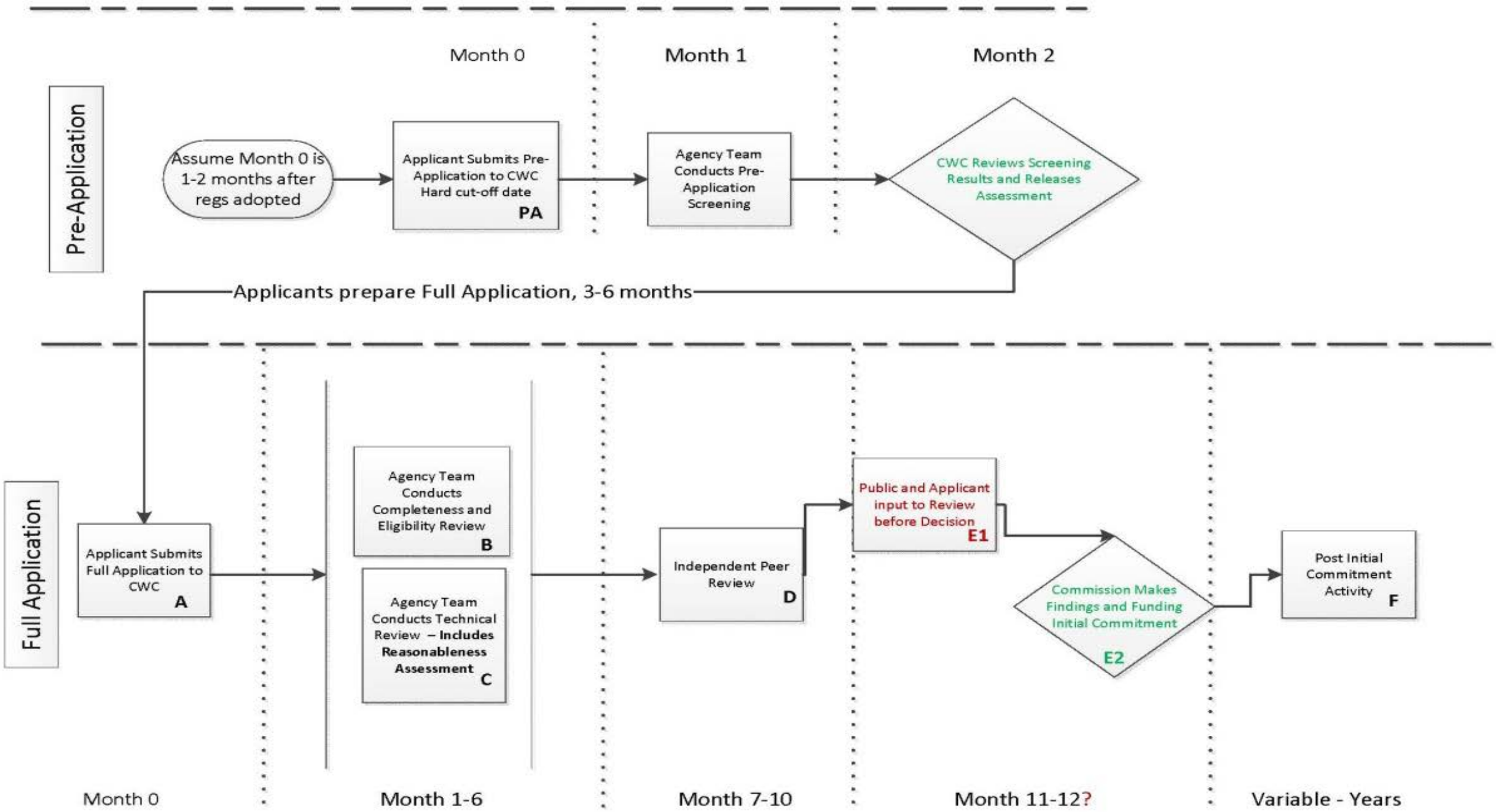
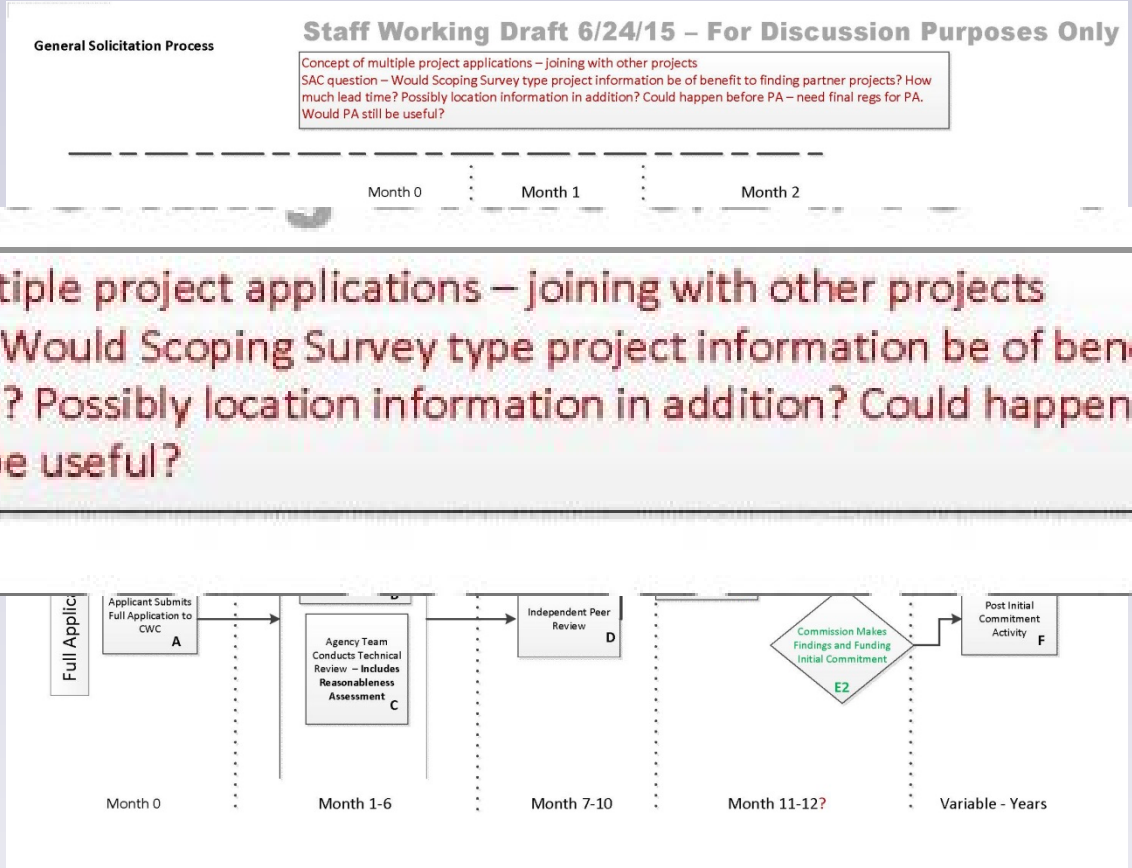

Month 0
Month 1
Month 2
Pre-Application
Assume Month 0 is 1-2 months after regs adopted
Applicant Submits Pre-Application to CWC Hard cut-off date
PA
Agency Team Conducts Pre-Application Screening
CWC Reviews Screening Results and Releases Assessment
Applicants prepare Full Application, 3-6 months
Full Application
Applicant Submits Full Application to CWC
A
Agency Team Conducts Completeness and Eligibility Review
B
Agency Team Conducts Technical Review – Includes Reasonableness Assessment
C
Independent Peer Review
D
Public and Applicant input to Review before Decision
E1
Commission Makes Findings and Funding Initial Commitment
E2
Post Initial Commitment Activity
F
Month 0
Month 1-6
Month 7-10
Month 11-12?
Variable - Years

# SAC Questions




Concept of multiple project applications – joining with other projects
SAC question – Would Scoping Survey type project information be of benefit to finding partner projects? How much lead time? Possibly location information in addition? Could happen before PA – need final regs for PA. Would PA still be useful?



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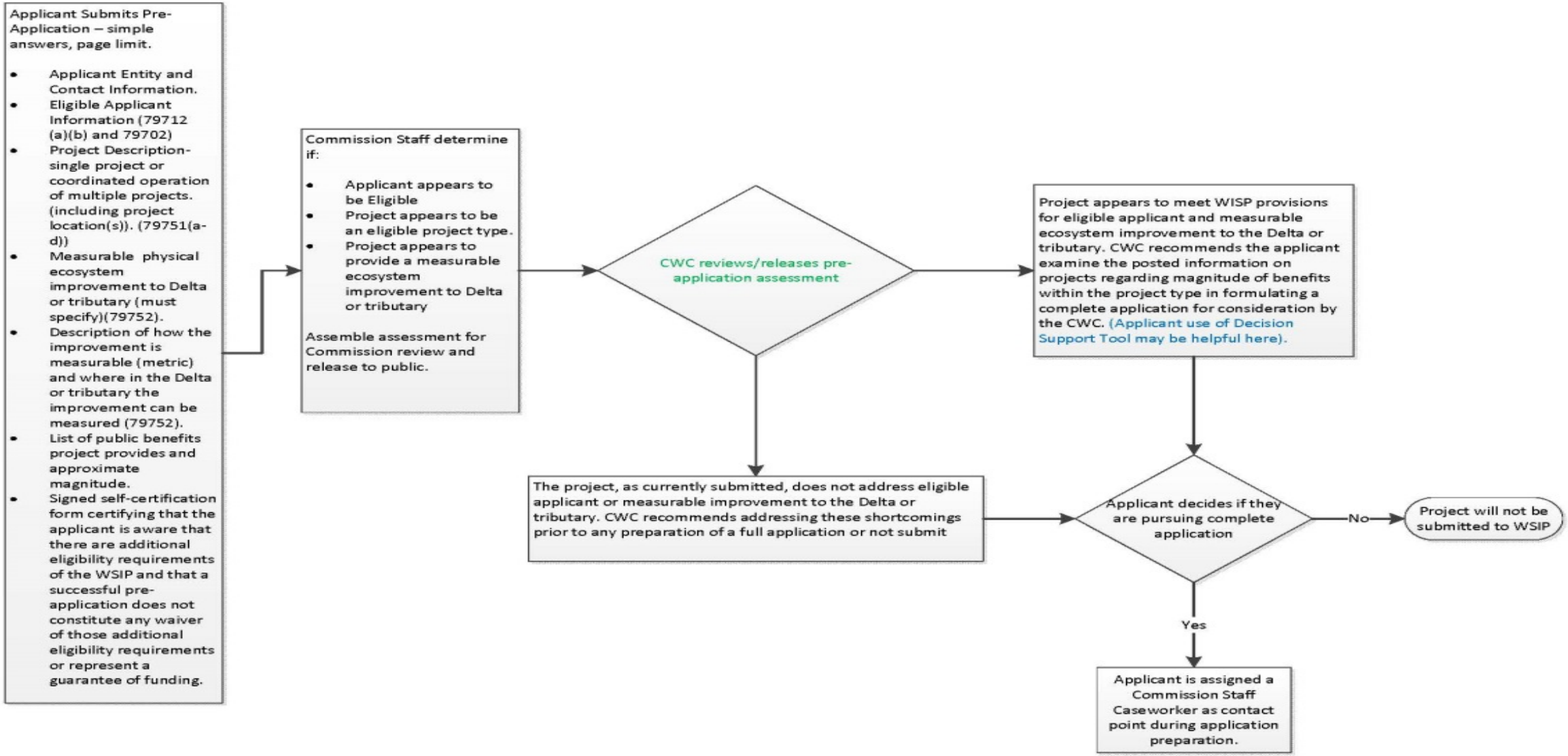
PA – Preliminary Application



A – Application Submittal

Staff Working Draft 6/24/15 – For Discussion Purposes Only

**Objective**

To receive all information for evaluation.

**What Materials?**

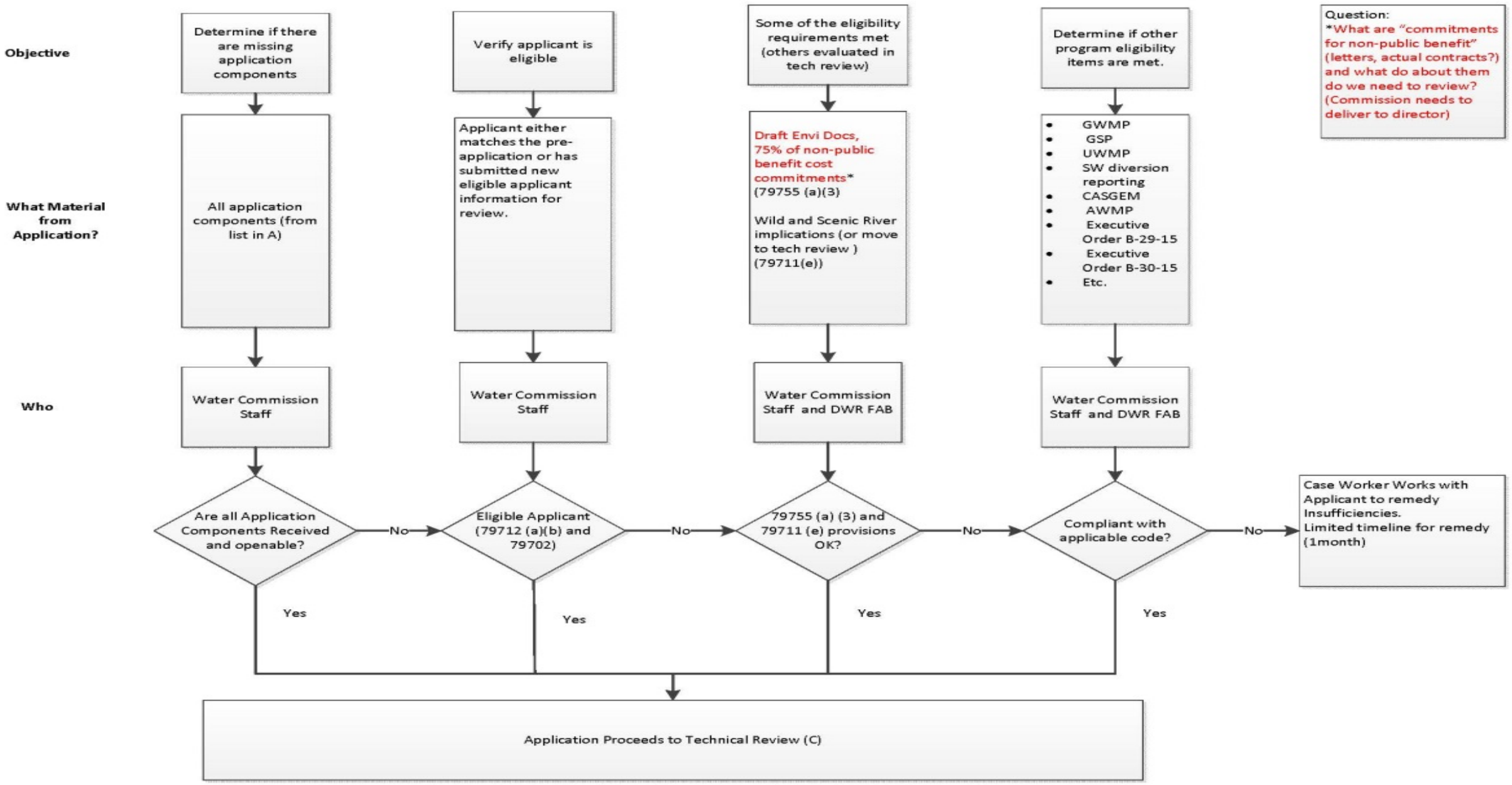
Applicant submits(list):

WORK IN PROGRESS – back populate from B,C,D
Application components still being determined

Via Electronic Submittal Tool

Application material to Completeness Eligibility Review (B)

## B – Eligibility and Completeness



## C – Technical Review

Tech team interface with Applicant for clarification of info? Limits?

Feasibility (79757 (a)(1) and 79755(a)(5)(A)(B))

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Objective** | 1. Technical Feasibility | 2. Verification of physical benefits (pubic and non), Benefit to Delta or tributary | 3. Econ Analysis | 4. Environmental Documentation/ Permits | 5. Restore ecological health and improve water management for beneficial uses of the Delta (79755(a)(5)(B)) | 6. Project tasks, budget, schedule | 7. Success Measures and Assurances | 8. Program Priorities and Relative Envi Values |
| **What Material from Application?** | Feasibility Study for the project (WSIP specific model runs and WSIP Economic Analysis listed as separate portions of review.) | Operational Model Runs with WSIP common/preferred assumptions + any associated updates to feasibility study information including climate change sensitivity analysis. | Econ Analysis using physical benefits from WSIP Operational Model including cost allocation<br>Cost Estimate (budget) | Current Environmental Documents | Information from 1-4 | Workplan for project activities through construction.<br>Budget and supporting basis of estimate<br>Proposed schedule of project activities | Technical Managerial and Financial Capacity<br><br>Monitoring and Assurance Plan Concepts | 1. DFW ecological priorities and relative environmental values.<br>2. SWRCB water quality priorities and relative environmental values.<br>~~3. Other Priorities?~~ |
| **Who** | Commission Staff<br>DWR | Commission Staff, Consultant, DWR | Commission Staff, Consultant, DWR | Commission Staff, DWR, SWRCB, DFW | Commission Staff, DWR, SWRCB, DFW, DSC, RWQCB | Commission Staff<br>DWR, DFW, SWRCB | Commission Staff<br>DWR | Commission Staff, DWR, SWRCB, DFW, DSC, RWQCB |
| **Output** | Concurrence on technical feasibility of project:<br>• Project Descrip<br>• Supporting Studies<br>• Supporting Data/Technical info<br>• Water balance<br>• Operations Plan<br>• Constructability<br>• Improves operation of a state water system. | • Quantities of Physical Benefits<br>• Improved operation of water system<br>• Benefit to Delta or Trib<br>• Benefit synergies in multiple project packages vs. component projects<br>• Reasonableness Assessment if preferred assumptions not used<br>• Project sensitivity | • Cost effectiveness (Economic feasibility)<br>• Monetized magnitude of benefit<br>• Verify Cost Allocation<br>• Verification of max allowable grant amount | • Status of:<br>• Envi Docs (at least public draft)<br>Identification of mitigatable and non-mitigatable impacts<br>• Permits<br>• Water rights | • Project benefits support co-equal goals.<br>• Delta Plan-self-certification check list<br>• Net improvement to ecosystem or water quality condition (79750 (b))<br>• Findings from Agencies that project benefits meet requirements of Ch8 | • Work plan is implementable<br>• Costs are reasonable and logical.<br>• Request for final environmental documents/ permit funding<br>• Schedule is reasonable for described tasks | Assessment of whether the applicant demonstrates capacity to under take a project of the magnitude being proposed.<br><br>Assessment of proposed benefit monitoring. | • How each application addresses priorities.<br>• Either a comparative analyses of relative environmental values between projects of similar type and magnitude of benefit or relative environmental values applied to each application. |

Information to Independent Peer Reviewers

D – Independent Peer Review



Purpose of Independent Peer Review is to conduct QC review of Technical Evaluation performed by Technical Review Team.
Independent Peer Reviewers receive Technical Review Information, access to applications to assess Tech Review (What packaged form of tech review?)

Independent Peer Reviewers works with Technical review team to resolve any questions regarding review information

Independent Peer Reviewers work with Tech Review Team to formulate project portfolios for CWC considerations.
Decision Support Tool would be helpful here.

Tech Review Team performs integration study on project portfolios

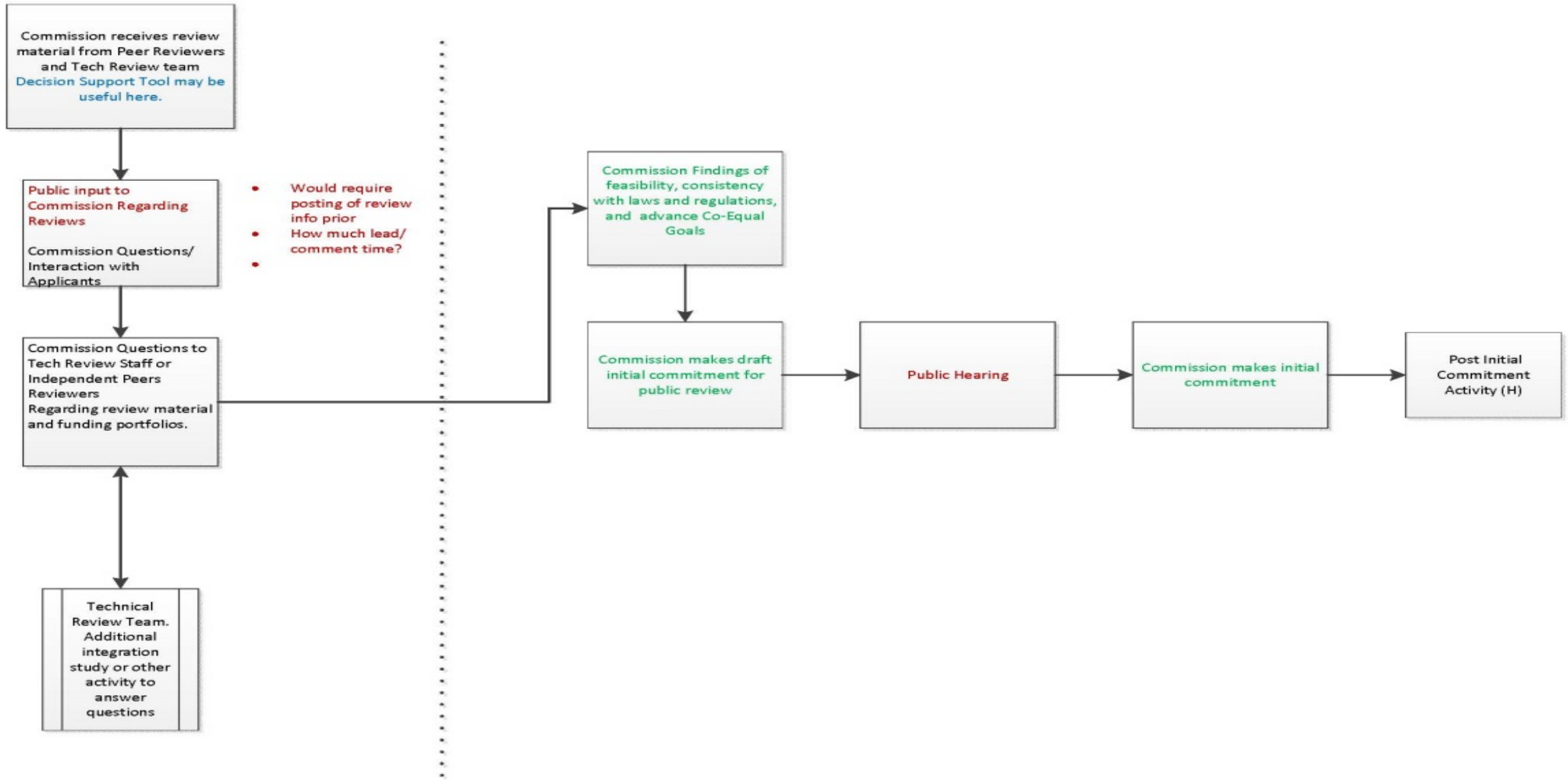
Tech review team prepares information package for CWC.

Independent Peer Reviewers final review of information package and release findings to CWC.

Information to CWC:

- Independent Peer Reviewer Findings
- Project Applicant
- Project Descriptions
- Maximum CWC funding allowed (79756 (a)(b))
- CWC funding request
- Total Project Cost (cost through construction not life cycle)
- Budget – are they requesting funding for Permits?
- Public Benefit
  - Public Benefits provided (79753) - types
  - Magnitude of Physical Benefit (79750)(b), 79753, 79756(b))
  - Magnitude of Monetized Benefit (79750)(c))
  - Magnitude of Monetized Benefit (79750)(c)) normalized on cost of investment
- Improves a water system of the state (79750(b)
- Net improvement in ecosystem and WQ condition (79750 (b))
- Provides measurable ecosystem benefit to Delta or tributary (79752)
- Assessment of Project and Co-equal Goals (79755(a)(5)(B))
- Project Feasibility Assessment (79757(a)(1), 79755 (a)(5)(A)(B))
  - Technical feasibility
  - Economic feasibility
  - Financial feasibility
  - Environmental feasibility (Envi Documents)
- CEQA summary
  - Status of Envi Docs and permitting (79755(a)(5)(C ) &79755(c )
  - Mitigatable Environmental Impacts
  - Non-mitigatable Environmental Impacts
  - Cumulative Impacts
  - Tribal Consultation (AB 52)
- Agency findings (DWR, SWRCB, DFW) that Public Benefits claimed are consistent with Chapter 8 of Act. (79755 (a)(3))
- Priorities and Rel Envi Values applied to Project (79754)
- Status of Contracts for Non-public benefits (79755(a)(2))
- ~~Status of Agency Contracts for public benefits (79755(a)(3))~~
- Timeline to finish construction
- Technical, Managerial, Financial Capacity & Benefit Monitoring

# E – CWC Findings and Initial Funding Decision



F – Post Initial Commitment Activity

**Staff Working Draft 6/24/15 – For Discussion Purposes Only**

| | | If funding ~~Final Envi Doc and~~ Permits | Funding of Construction Costs | | | |
|---|---|---|---|---|---|---|
| **Time** | 1 Month | | Variable - months to years | 3 Months | Years | ? Years |
| **Activity** | Soft Commitment | Hard Commitment for only limited costs (79755(c )) | Complete 79755 (a) items | Hard Commitment. Encumber funding and execute agreement | Implementation of Agreement through Closeout | Post Construction Benefit Monitoring and Management |
| **Includes** | CWC tentative commitment of a not to exceed amount via letter. Establishes communication and necessary docs for hard commitment. Can include<br>• Audited Financials – annual until hard commitment (need 3yrs worth to review before execute agreement)<br>• Additional information on environmental doc status, or request for information necessary to clear any other concerns (completed UWMP, GWMP plan etc…)<br>• Must complete items in 79755(a)<br>• If ~~Environmental Document/~~Permit funding – initiate Agreement Development<br>• Update to CWC at least annually | Funding here would count against total funding cap.<br><br>Develop agreement<br>Execute Agreement<br>Administer<br><br>Reimburse on proportional share (public benefit cost share to non-public benefit cost share) | No hard commitment until:<br>• Contractor Bidding complete. Final project costs determined.<br>• 100% Contracts for non-public benefit cost share obtained<br>• Public Agency Contracts completed.<br>• Final Environmental Documents and Permits (CWC has performed Responsible Agency Duties (concurrence))<br>• Final Permits<br>• 79755(b) – CWC will need to submit findings to legislature for each 79755(a) criteria. Need to work out how this will occur – periodic from soft commitment forward until all awardees complete this step? | • Encumbrance of funds by commission staff w/ assistance from DWR FAB.<br>• Sets up the vendor, specific funding, all codes necessary to track funds. GO Bond, project, tax certification, public reporting items necessary for tracking of GO Bond funding.<br>• Development of Agreement may involve updated scope, schedule, budget.<br>• Execution of agreement involves Grantee, Commission and Legal Counsel for the Commission (legal sufficiency). | Grant Administration by Commission Staff, payment of invoicing, progress reporting, Amending agreement as project is implemented and budget shifts.<br><br>Commission staff will also need to manage the larger funding picture – liquidation periods. And GO bond reporting. | Implementation of contracts between Grantee and Resources Agencies for obtaining public benefits of project.<br><br>Any reporting to Commission at this point or is Commission's involvement completed at Agreement Close out? |

# Questions?

# Definitions
Update

# Status

- Completed tabular summary of comment letters received to date to provide to the Commission at the July 15th meeting
- Comment letters will always be provided to the Commission

**Summary of Stakeholder Advisory Committee Member Comment Letters on Definitions of Public Benefits and Eligible Project Types**

At the May 4 2015 Stakeholder Advisory Committee (SAC) meeting, SAC members were asked by staff to provide written comments on the staff draft definitions of public benefits, eligible project types, and public trust resources by May 15, 2015. Nine sets of written comments were received from SAC members and a set of comments was received from an agency participating as part of the public. In addition to comments on public benefits, eligible project types, and public trust resources, SAC members and the public commented on the proposed technical and economic analysis, grant solicitation and review process, and the regulations and guidelines.

The comments in their entirety are attached. Below is a summary of the recommendations and suggested revisions received from the SAC members and staff's response.

| Comment ID | Topic | Comment | Times Mentioned | Staff Response |
|---|---|---|---|---|
| **Public Benefits** | | | | |
| PB-1 | Ecosystem | Wildlife areas and refuges should be eligible for funding. Amend the document to clarify that | 4 | Comment noted and consistent with staff draft definition. "Wildlife refuges" have been |

# Facilitated Discussion

- Should water for fire suppression be eligible for public benefit funding under the emergency response category?
  - If yes, how should water supply for fire suppression be accounted for?
- Should emergency reserves of drought water supply be eligible for public benefit funding under the emergency response category?

# Water Storage Investment Program
## SAC Next Steps and Action Items



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# Public Comment