

# CAST Updates Options: Presented to WQGIT 5-22-23

This new option is under consideration by WQGIT voting members, tentative timeline for decision is July 2023

# March 2022 Approved Phase 7 Development Schedule

Year	2022	2023	2024	2025	2026	2027	2028
Phase 6 CAST	CAST6-2021		CAST6-2023		CAST6-2025		
Phase III WIP evaluation	Implement				Evaluate and track with Phase 6		
Current Climate Plans	Build Models		Review CAST	Develop 2035 targets with P7 models, Review estuary model	P7 CAST25 Available for Use		
WQGIT Recommends	Build Models				Review Models	New 2035 climate targets with P7 models	P7 CAST27 Available for Use

## Important Notes: We are not on track with this approved schedule

- CAST23 will be the model of record for the evaluation of 2025 Progress
- CAST23 will not include the FY22 Ag Census or the High-Resolution Land Use Data from 21/22
- CAST25 will introduce FY22 Ag Census or the High-Resolution Land Use Data from 21/22
- Schedule provides a full year of review for Phase 7 suite of tools
- Schedule results in Climate Targets at the end of 2027

# Option 1: Revision to the Phase 6 CAST Release Schedule

Year	2022	2023	2024	2025	2026	2027	2028
Phase 6 CAST	CAST6-2019		CAST6-2021		CAST6-2025		
Phase III WIP evaluation	Implement				Evaluate and track with Phase 6		
Current Climate Plans	Build Models		Review CAST	Develop 2035 targets	Track with Phase 7		
Phase 7 PSC Approved	Build Models that will also Address 2035 Climate Change Conditions				Review Models	New 2035 climate targets with P7 models	Track with Phase 7

## Important Notes:

- **CAST2X proposed release in September 2023**
- **CAST2X would be the model of record for the evaluation of 2025 Progress**
- The 2025 progress evaluation would have interim targets based on the definition of unaccounted additional loads that include 2025 climate change
- CAST25 would introduce FY22 Ag Census and the High-Resolution Land Use Data from 21/22, not used for 2025 Progress
- CAST25 would be the last update to the Phase 6 series of CAST – Release on June 30, 2025

# Option 2: Revision to the Phase 6 CAST Release Schedule

Year	2022	2023	2024	2025	2026	2027	2028
Phase 6 CAST	CAST6-2019		CAST6-2021				
Phase III WIP evaluation	Implement				Evaluate and track with Phase 6		
Current Climate Plans	Build Models		Review CAST	Develop 2035 targets	Track with Phase 7		
Phase 7 PSC Approved	Build Models that will also Address 2035 Climate Change Conditions				Review Models	New 2035 climate targets with P7 models	Track with Phase 7

## Important Notes:

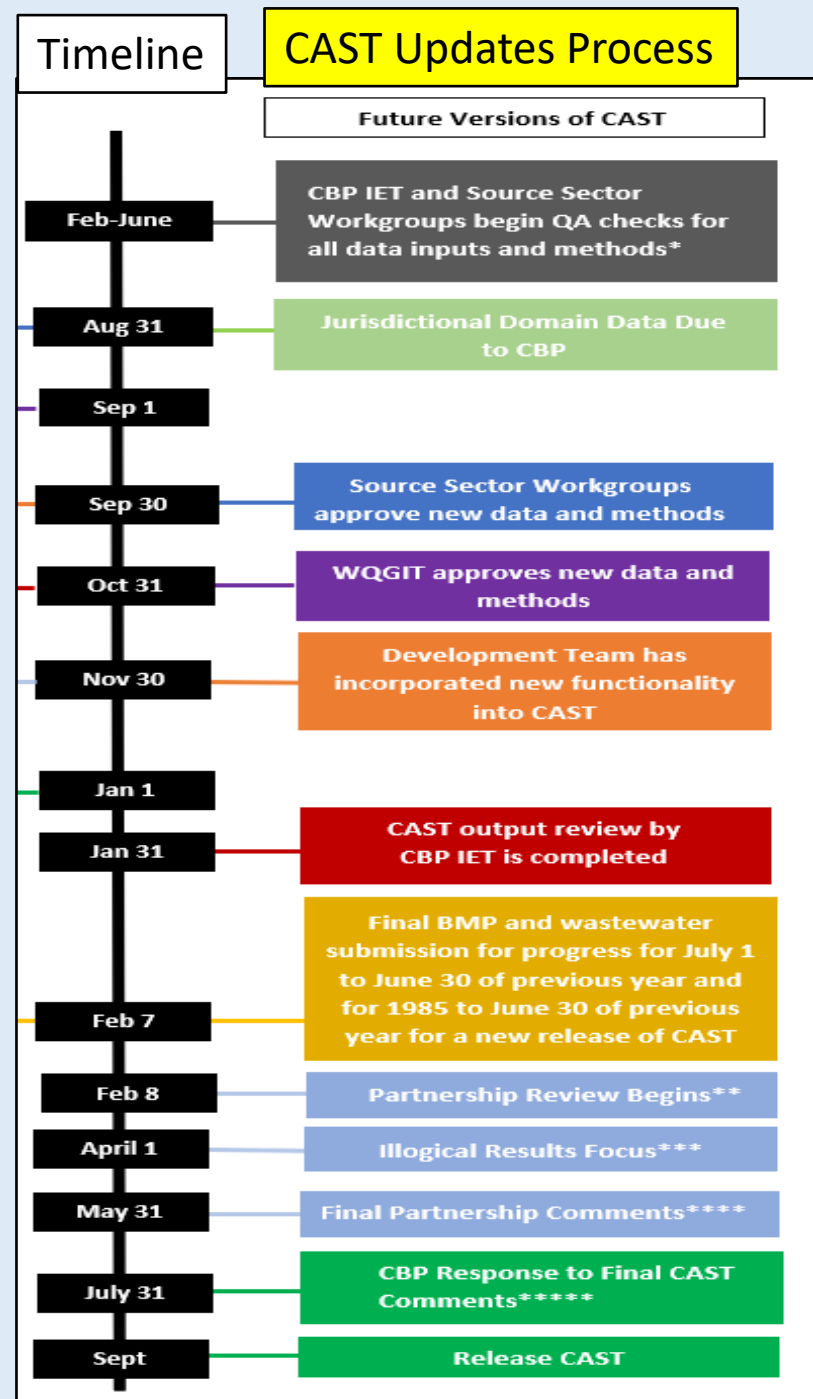
- **CAST2X: proposed release in September 2023**
- **CAST2X: would be the model of record for the evaluation of 2025 Progress**
- The 2025 progress evaluation would have interim targets based on the definition of unaccounted additional loads that include 2025 climate change
- This is the last update to CAST in the Phase 6 model period

## Option 2: Timeline and datasets

- Next release of CAST Phase 6 would be the model used to evaluate Progress through 2025, no additional Phase 6 model updates would occur
- CAST 2X- released as early as August 2023, as late as June 2024 - incorporate Phase 6 fertilizer recommendations currently being proposed by the AMT and USWG, and possibly the 2 additional BMPs that completed Expert Panels- Oyster Restoration and Mortality Composting BMPs
- CAST version used to evaluate 2025 Progress would **not** include these datasets, they would be included in Phase 7 along with other updated datasets available
  - 2022 Census of Agriculture- to be released Spring/Summer 2024
  - 2022-23 High Resolution Land Use- to be completed June 2024
- 2025 Progress evaluation to be completed in late 2026 with interim planning targets that are consistent with the definition of unaccounted additional loads

The WTWG developed a **CAST updates process and timeline** in response to the PSC Decision 3 charge

**CAST Updates Process**, not necessarily the **Timeline**, would apply to all future CAST updates and ideally be incorporated into the approach for Phase 7 development if applicable



# CAST 2025 - Phase 6 Final Release Schedule

	2024											2025											2026						
Activity	Feb 1	3-24	4-24	5-24	6/30	7-24	8/31	9/30	10/31	11/30	12/1	Jan/31	2/7	2/8	3-25	4-25	5/31	6/30	7-25	8-25	9-25	10-25	11-25	12/1	Jan-26	2/7			
CBP IET and Workgroup Data QA Checks																													
Jurisdictional Domain Data Due																													
Source Sector Workgroup approve new data and methods																													
WQGIT approve new data and methods																													
Development Team Completes Updates																													
Submission of State BMP Data and History Updates for 2024 Progress																													
CBP IET Review of CAST Outputs																													
Complete BMP and Wastewater Submission for 2024 Progress																													
Partnership Review with CBP IET Support- Illogical Result Deadline at halfway point of review period, Final Jurisdictional Comments-May 31																													
CBP response to Final Comments July 31- continue work on unresolved issues																													
Release CAST																													
Submission of State BMP Data and History Updates for 2025 Progress																													
Complete BMP and Wastewater Submission for 2025 Progress																													

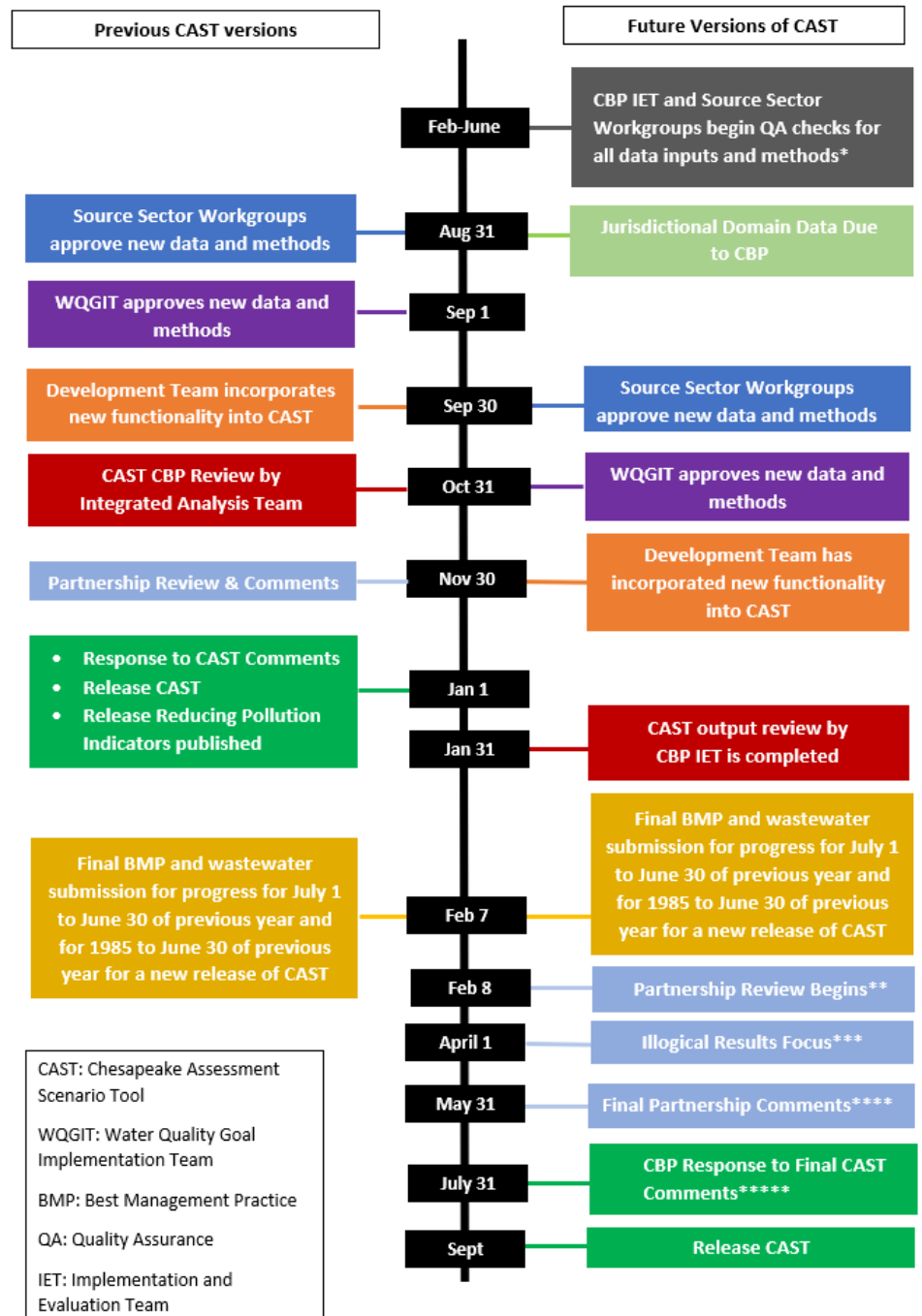
## PSC Action & Decision #3: **WTWG Recommendations**

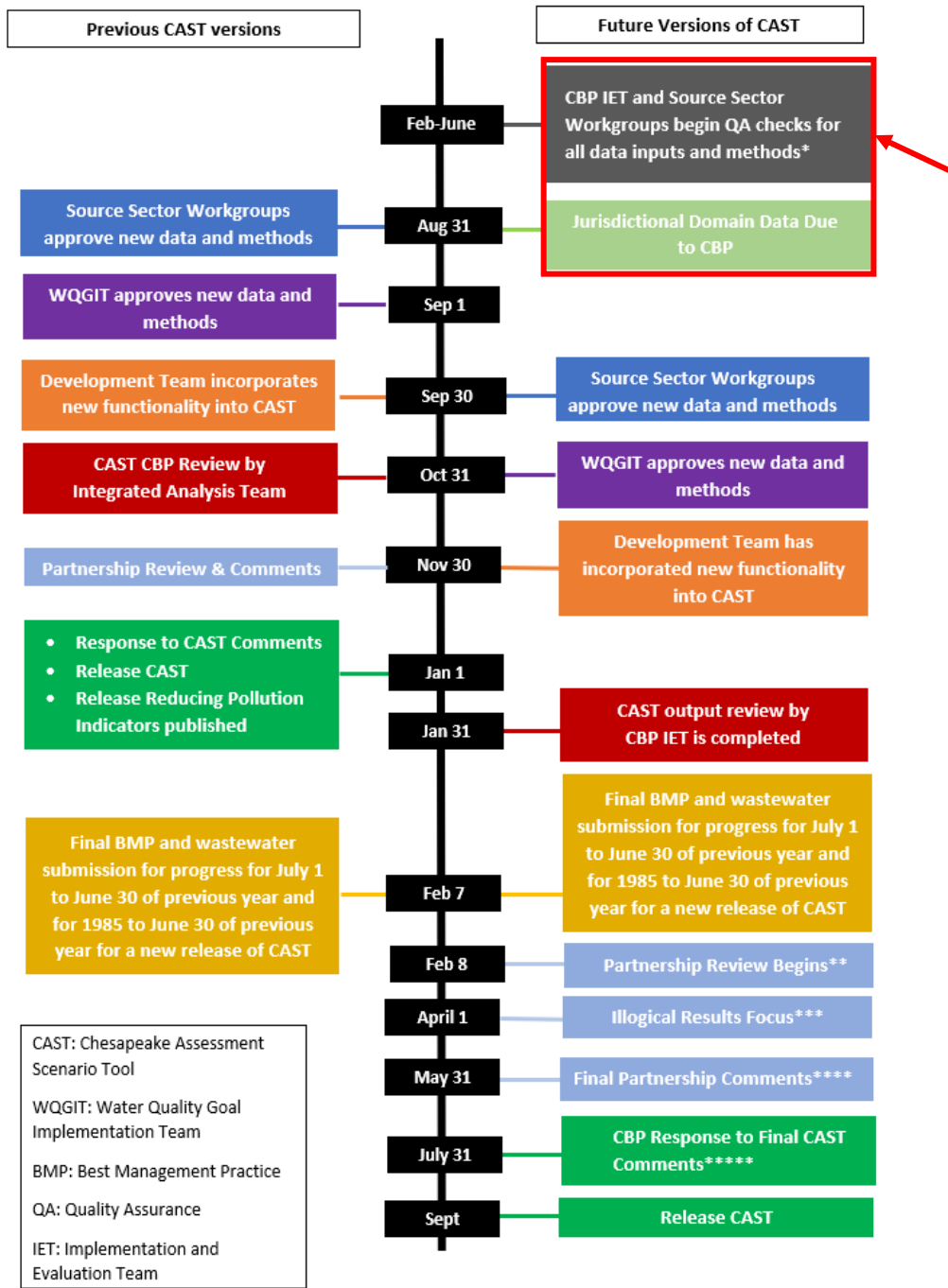
- **Decision:** The partnership will **update the process for incorporating data into CAST to include additional safeguards to prevent data analysis errors and to assess reasonability of modeling results after CBP protocols are applied.**
- **WTWG broke charge into two parts: PRE (Track 1) and POST data processing (Track 2)**
  - **Pre-Data Processing:** Safeguards and protocols to prevent and protect against data input errors
  - **Post Data Processing:** A process/protocols to assess reasonability of results ("after protocols are applied" means "when we see results")
- **Evaluated each track separately; addressed both within the framework of a formalized *CAST Updates Review Process***



## Draft revised *Phase 6 CAST Updates Review Process*- outlines a comprehensive quality assurance procedure and corresponding timeline for CAST data updates.

- Emphasizes and incorporates the initial data, methods, processes and documentation review into the timeline- jurisdictions, WG's & IET
- Lengthens jurisdictional review period
- Adjusts timing of the jurisdictional review
- Emphasizes IET support, communication and prioritization during jurisdictional review
- Addresses perceived anomalies in a timely, scientifically valid and consistent fashion
- Suggests recourse for unresolved issues



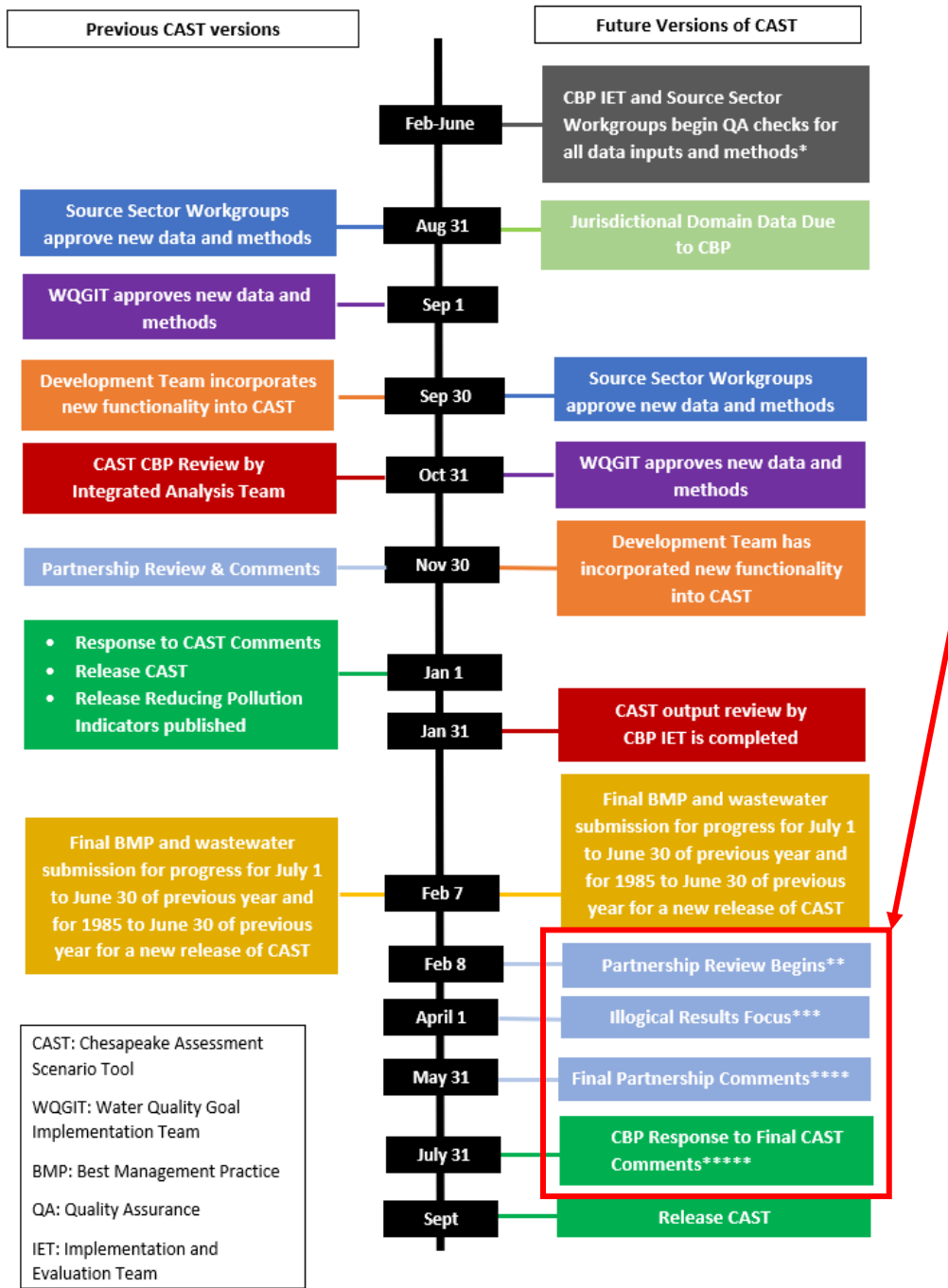


# Track 1-Inputs

Includes a review of data inputs within this process-workgroup coordinators and IET (Implementation and Evaluation Team) would ensure that this process occurs

## Data input QA/QC Checks (gray and light green boxes) Recommendations:

- Model update review process begins with a quality assurance review of data input sources, data preparation methods, model processing methods, and corresponding documentation
- Review should begin within appropriate source sector workgroups in February of a data update year
- Review of methods, processes and documentation need not wait for the new data to become available
- When new data becomes available a data specific quality assurance review should begin
- Workgroup coordinators should initiate this process with support from the CBP IET to maximize the review period prior to the approval of new data and methods.



# Track 2: Outputs and Anomalies

**Jurisdictional review of CAST model outputs broken into 4 main steps:**

**Partnership Review Begins:** Ongoing IET jurisdictional support, jurisdictional identification of anomalies

**Illogical Results Focus:** IET jurisdictional and workgroup support, review process steps

**Final Partnership Comments Due:** would include documentation of persisting unresolved issues

**CBP IET Response to Final CAST Comments:** would include unresolved issues and path forward

## Track 2: Outputs and Anomalies

**Partnership Review Begins:** CBP IET jurisdictional support, jurisdictional identification of anomalies

### Recommendations:

- Jurisdictional review must occur in a timely fashion- begin as close to Feb. 8 as possible
- **Jurisdictional Support During the Entire Review Process:**
  - CBP EIT staff available to answer questions, investigate issues
  - IET jurisdictional support products for viewing and analyzing data
    - Example: **CAST Comparison Tool:** allows “apples to apples” comparison, previous or current progress year could be looked at in the existing model versus the newly updated model version
- Make assertions for unresolved data anomaly/illogical output issues by **March 31<sup>st</sup>** to IET and relevant source sector workgroup

Final BMP and wastewater submission for progress for July 1 to June 30 of previous year and for 1985 to June 30 of previous year for a new release of CAST

Feb 7

Partnership Review Begins\*\*

Feb 8

Illogical Results Focus\*\*\*

April 1

Final Partnership Comments\*\*\*\*

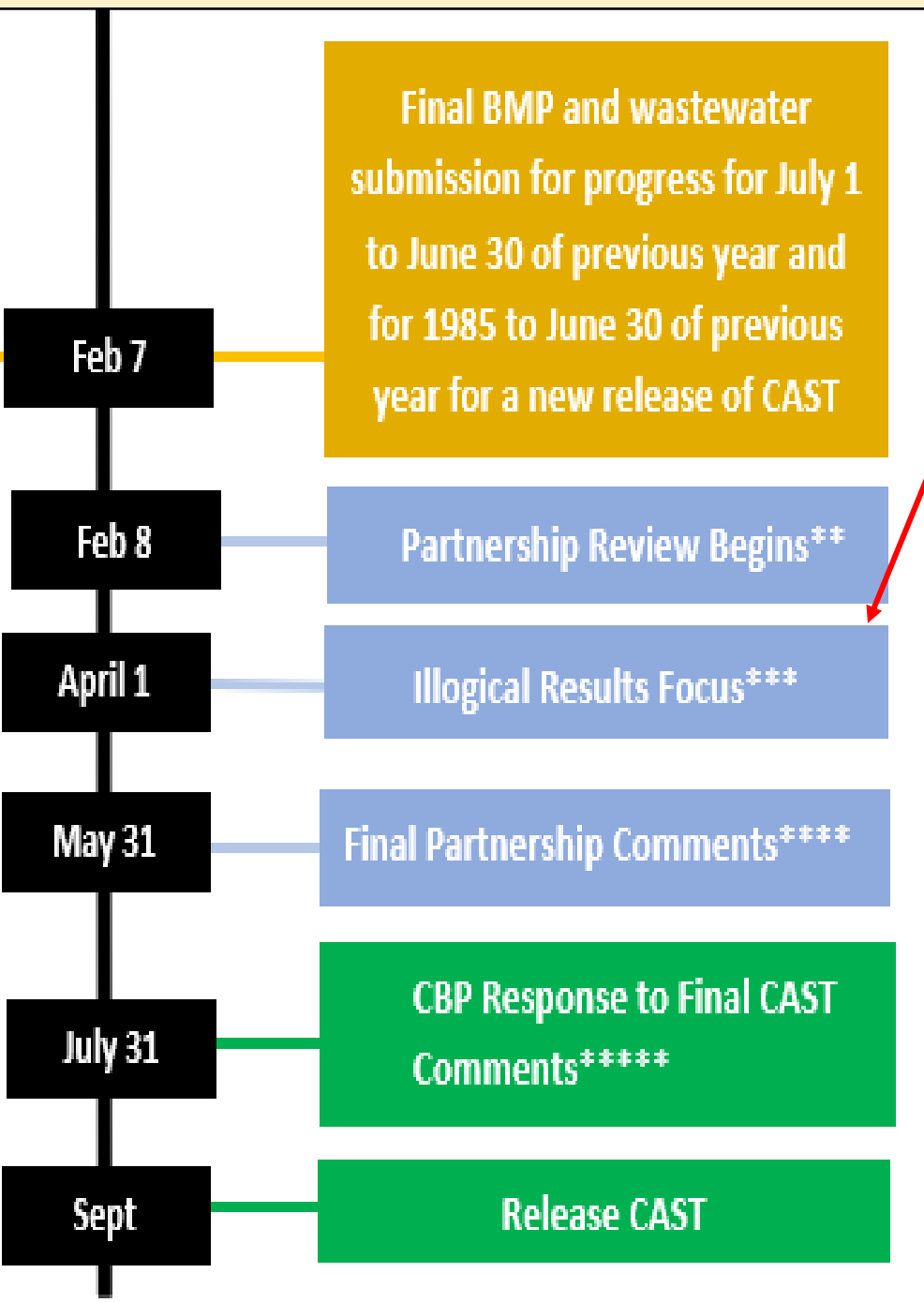
May 31

CBP Response to Final CAST Comments\*\*\*\*\*

July 31

Release CAST

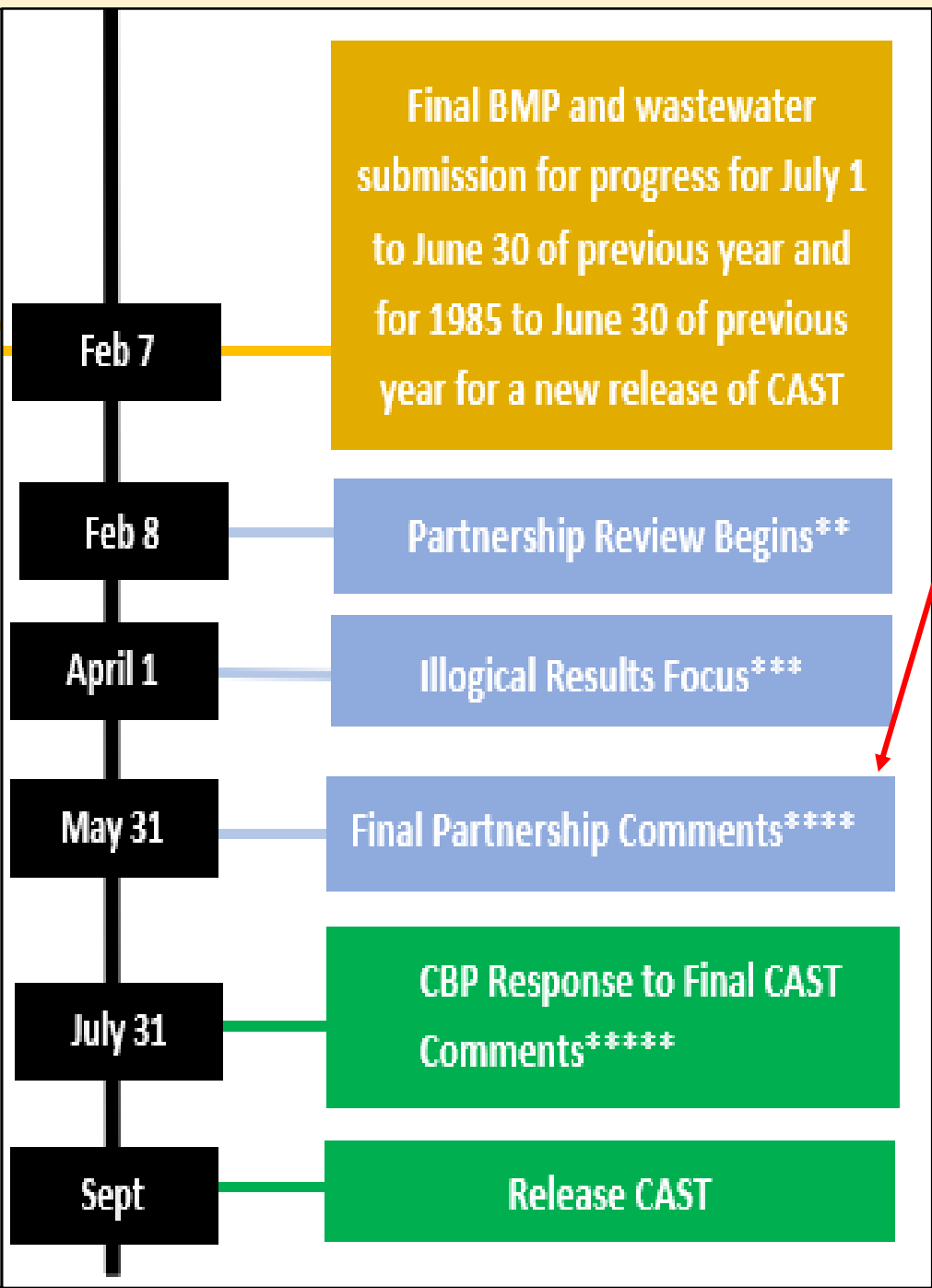
Sept



## Track 2: Outputs and Anomalies

**Illogical Results Focus:** EIT and source sector workgroup jurisdictional support, review process steps

- Recommendations:**
- April 1st Begin further investigation of contended anomalies within appropriate **source sector workgroup** with support from IET
  - Contender should illustrate/present why data results are illogical; scientifically support or validate that the result is not representative of real change that has occurred from the previous model version
  - Workgroup members should confirm or agree that results are illogical
  - If agreed upon, workgroup, supported by IET seeks resolution of the anomaly with goal of approving the proposed solution by late May



## Track 2: Outputs and Anomalies

**Final Partnership Comments Due:** would include documentation of persisting unresolved issues

- Recommendations:**
- If resolution of the anomaly cannot be achieved at the workgroup level, the contender documents the issue in their Final Partnership Comments
  - The issue should be presented to the WQGIT for review
  - The partnership would need to confirm results are illogical, and that no acceptable resolution has been proposed by the workgroup/IET

## Track 2: Outputs and Anomalies

**CBP EIT Response to Final CAST Comments:** would include proposed path forward for unresolved issues

Next steps if WQGIT confirms the issue remains unresolved:

### Recommendations:

- IET and appropriate source sector workgroup continue work on the issue until an agreed upon solution is developed
- Option to revert to previous model data and methods related to the anomalous results and CAST update is released

Final BMP and wastewater submission for progress for July 1 to June 30 of previous year and for 1985 to June 30 of previous year for a new release of CAST

Feb 7

Partnership Review Begins\*\*

Feb 8

Illogical Results Focus\*\*\*

April 1

Final Partnership Comments\*\*\*\*

May 31

CBP Response to Final CAST Comments\*\*\*\*\*

July 31

Release CAST

Sept

## August 29 PSC Action & Decision #3: **WTWG Recommendations**

- **Decision:** The partnership will **update the process for incorporating data into CAST to include additional safeguards to prevent data analysis errors and to assess reasonability of modeling results after CBP protocols are applied**. [underline added]
- **WTWG broke charge into two parts: PRE (Track 1) and POST data processing (Track 2)**
  - **Pre/Track 1:** Safeguards and protocols to prevent and protect against data input errors
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# Consensus Continuum

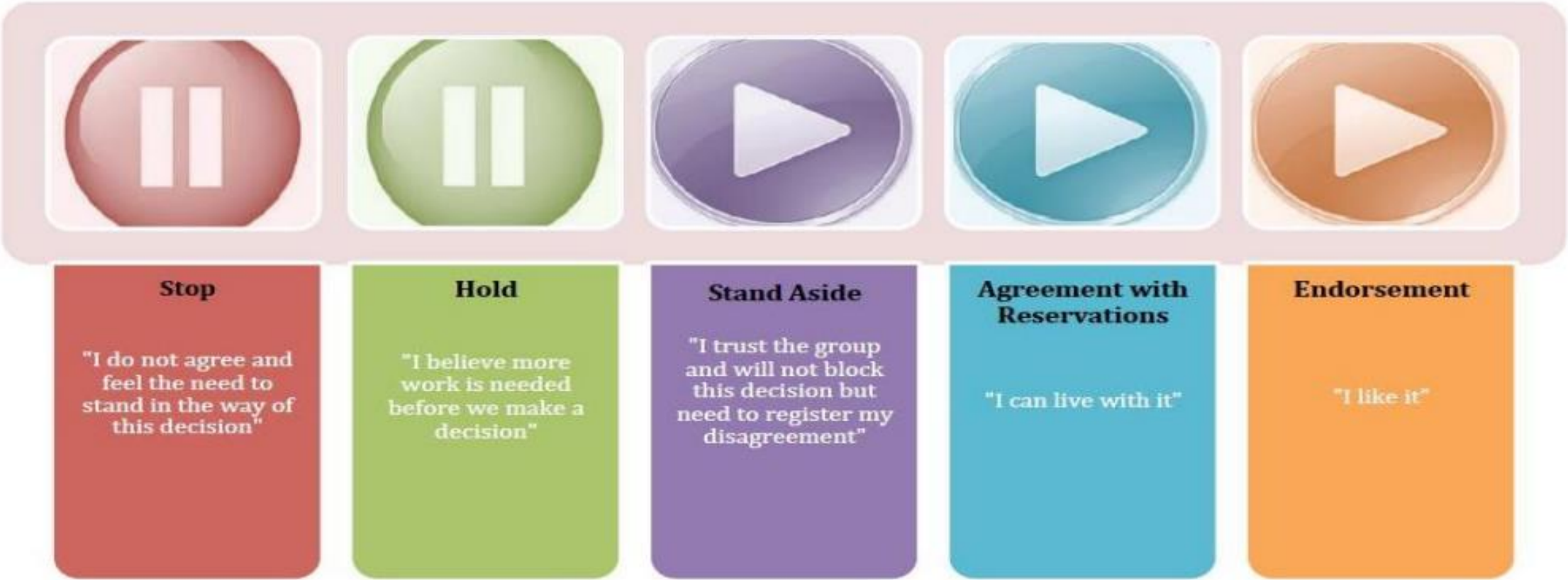


Figure 1. The Consensus Continuum