San Diego Bacteria TMDL Meeting, 11/19/15
Meeting Notes, Action Item List, Decision Record, and Parking Lot

MEETING NOTES
The meeting summary is organized around major points in the meeting agenda, which is included at the end of the meeting summary, along with a list of attendees. Agreements are **highlighted in bold**. Action items are listed at the end of the meeting summary.

1. *Introduction and Purpose of Meeting*
The purpose of the meeting was to:

- Continue discussion on draft TMDL target language
- Provide background on TMDL allocations (time permitting)

2. *"Decision" on 32/1000 vs 36/1000 rate*
Chris Crompton (County of Orange) raised the issue of how the choice between the 32/1000 and 36/1000 illness rates was represented in the summary of the previous meeting. This is not a strictly scientific decision and is not something that should properly be decided at the Workgroup level. **The participants agreed that documents be worded to reflect that the choice of the 32/1000 illness rate is a working assumption.**

The Workgroup then discussed the value of examining the implications associated with implementing both illness rates and comparing the differences between the two (e.g., exceedances, compliance probability). The consulting team was asked to identify the specific analyses needed to compare the two illness rates (e.g., allocations, exceedance frequencies), including what would be needed for a 13241 assessment, and to prepare an estimate of the time and expense involved. (**Action Item**)

These comparisons will help inform the Cost Benefit Analysis (CBA), in particular the relative difference between the two illness rates. The pending SWRCB Revision of Bacterial Objectives may bear on this decision and Jeremy Haas (RWQCB) said that he would contact the SWRCB to ask if the Workgroup could meet with them as a separate focus group to discuss the policy and report back next month. (**Action Item**)

The consultant team was also asked to examine the 13241 requirements to identify what information would be needed to address those. (**Action Item**)

3. *TMDL Targets-Discussion Item*
(see "Mtng Bacteria TMDL Workgroup 11-19-15 Presentation Draft Items.pptx" distributed with this meeting summary)

The discussion began with a brief review of discussion and agreements at recent meetings (Slide 2) then identified the key topics for this meeting (Slide 3). Jeremy Haas (RWQCB) pointed out the need to clarify when the discussion refers to Water Quality Objectives versus TMDL Targets, because the objectives apply everywhere while the targets apply only in limited areas. Both are "on the table" in the current process. The distinction is also important because there are multiple options for achieving compliance with targets.

Risk based framework

Discussion of Element #1 (Slide 4) emphasized the need to highlight the ultimate goal, which is swimming safety, and not a specific set of TMDL targets. Thus, Jeremy Haas (RWQCB) suggested that other performance targets (e.g., the number of illnesses, number of days posted) could provide needed flexibility in meeting the ultimate public health goal. This would be analogous to the Nutrient Numeric Endpoints (NNE) policy development process, which is focusing more on endpoints such as algal biomass instead of fixed nutrient concentration targets. This would also make it easier to update the TMDL and use the best measurement tool when methods improve, without the necessity of a formal reopener (because the illness rate endpoint would remain the same). While that does focus directly on risk and provides more flexibility, Dustin Bambic (Paradigm) pointed out the need for some stability in endpoints and targets so that these do not move radically with every advance in the science. For example, in terms of the "interim" language in the 2nd bullet on Slide 4, if the science improves to the point where excess illnesses can be distinguished at the 8/1000 level, there should be careful consideration of the implications, costs, and benefits of moving to a lower level.

Jimmy Smith (RWQCB) asked for clarification that the illness rates in the EPA criteria are statistically based and Dustin Bambic (Paradigm) confirmed that this was the level of illness at which a difference from the background illness rate could be distinguished. In addition, while the 32/1000 illness rate represents an improvement in water quality compared to the 36/1000 illness rate, there is not necessarily an improvement in risk protection associated with the lower number. The consultants were asked to provide a written description of this background. (**Action Item**) Jimmy Smith (RWQCB) noted that the Cost Benefit Analysis will provide useful input into what is both protective and reasonable.

The participants agreed to adopt the proposed language related to the Clean Water Act in the Alternative language, and to add a caveat that the 32/1000 illness rate is a working assumption and not a final decision. (Action Item)

Discussion of Element #3 (Slide 6) focused initially on how to deal with the possibility that beaches might exist with illness rates lower than the target level. This could potentially be addressed as an antidegradation issue or as a high quality water and Jeremy Haas (RWQCB) suggested allowing for the possibility that the objective could move either up or down. Ruth Kolb (City San Diego) noted, however, given the expense and difficulty of conducting epidemiology studies, it is not likely that such data on illness rates would readily be available for additional beaches. Dustin Bambic (Paradigm) repeated his caution that the bar not move around frequently based simply on improved methodology, but thought that establishing a distinct expectation for a cleaner beach (or the region as Jeremy Haas (RWQCB) suggested) might make sense. Chris Minton (LWA) agreed that a minor revision to the language in the alternative on Slide 7 would capture the potential for regional linkages. (**Action Item**)

Chris Crompton (County of Orange) noted that there are only a few sites with unique features that remain a problem in dry weather, but that problems are more regional and widespread in wet weather. Thus, site-specific approaches are more appropriate for dry than for wet weather. Chris Crompton also suggested the value of working through prototype examples of site-specific objectives, such as perhaps Shelter Island or Baby Beach, to evaluate how the process would work and provide an opportunity to streamline the regulatory process. The consultant team was tasked to develop ideas for prototypes or case studies of site-specific objectives that would illustrate different issues such as natural source exclusion. (**Action Item – longer term**)

Dustin Bambic (Paradigm) explained the technical aspects of how QPCR is linked to sample culture numbers and the pros and cons of indicators such as Enterococcus, coliphage, and coliforms for different types of discharges.

Risk based target

Discussion on Slide #8 focused on how allowable exceedance frequencies should be interpreted and used. Duncan Bambic (Paradigm) said that one goal is to set targets in a way that avoids having open space watersheds with high exceedance rates. Jeremy Haas (RWQCB) said that the same exceedance rate at reference and urban sites would not be equivalent because there could be human sources in the urban site and that therefore the reference exceedance rate might not be directly applicable to urban sites. Ruth Kolb (City San Diego) noted that there are locations with combinations of both human and wildlife sources and that situations do not necessarily all divide cleanly into urban and natural open space. The consultant team will give more thought to the wording related to allowable exceedance frequency and come back with a revision. (**Action Item**)

Targets table

The discussion focused on issues raised by Slides #9 – 11. Dustin Bambic (Paradigm) explained that the geometric mean is related to risk but the Single Sample Value (SSV) is not. The SSV is the upper level of the sampling distribution on which the geometric mean is based and is intended to indicate a potential exceedance of the geometric mean when there are insufficient data to calculate the actual geometric mean. The Statistical Threshold Value (STV), as defined in the USEPA 2012 criteria, allows for a 10% exceedance rate, but in a way that can create additional exceedances that are an artifact of the lag time involved in the calculations. This can be addressed by increasing the number of sampling events, either by collecting more samples within the 30 day period or extending the time period, e.g., to 90 days. Jeremy Haas (RWQCB) said that a more fundamental issue is to define how the data and results will be used, e.g., assess against the TMDL target, risk communication, listing, etc. and that it is important to be aware of the implications in different contexts, and that different targets might be best suited for different purposes. For example, if the assessment period is extended to reduce the exceedance problem, it could make it more difficult to identify the period of time with an actual problem. Dustin Bambic (Paradigm) said that one solution to this problem is to use the SSV, which would be more protective because there is no allowance for exceedances. Dustin agreed with Jeremy's earlier statement that it will be important to define how the SSV would be used, e.g., to flag attention, as a trigger for additional sampling, as part of compliance determination. However, it is important to understand, especially in the context of the RWQCB's focus on swimming safety, that there is no direct link between the SSV and the illness rate.

Jeremy Haas (RWQCB) said that if there is a risk based approach to the water quality objective then the TMDL target should be the geometric mean and not the SSV because the core purpose is to achieve long-term compliance with the TMDL targets. Because the geometric mean is directly related to the illness rate (and therefore risk), it is a better measure of such compliance; but it may not be the best method for beach notifications, for which other indicators would be better suited. **The participants agreed that the geometric mean was an appropriate TMDL target for dry weather because it is a good indicator of the level of risk over time, but that additional thought needs to be given to the details of monitoring, averaging period, etc. in order to best measure trends in risk over time.** Chris Crompton (County of Orange) pointed out that the way this is worded will set the stage for future monitoring in terms of frequency of sampling, the averaging period for the geometric mean, whether there can be seasonal and annual means (e.g., for public communication and long-term trend tracking). It will be important to write this to ensure flexibility in the implementation.

Jimmy Smith (RWQCB) said that one potential problem with using the geometric mean as the compliance target is that it could be mistakenly interpreted to mean that every day in the averaging period was in compliance. This led to a discussion of the difference between safety defined at the population level (as in risk based public health policies) and safety defined at the individual and site/time specific level. Jimmy Smith also pointed out that there could be a disconnect between the water quality objective and the TMDL target if the water quality objective uses both the geometric mean and the SSV while the TMDL uses only the geometric mean. Jeremy Haas (RWQCB) said that the suggestion of using the SSV as an action level or trigger for additional sampling is useful and raised the question of what to do in

response to single high values. While individual high hits do not tell the entire story, they are potentially important information. Jimmy Smith (RWQCB) agreed with the value of knowing more about individual event with high values and was concerned about whether this meant that swimming was not safe at that day and time. Chris Crompton (County of Orange) said that the public health department is interested in extreme events and that this differs from longer-term TMDL compliance. In addition, the different temporal variance at creeks vs. beaches should be taken into account when deciding how to respond to individual events. The consultant team will prepare an explanation of "safe" in different contexts and what the implications could be for action in response to different types of monitoring outcomes. (**Action Item**)

Chris Crompton (County of Orange) pointed out that the geometric mean would not be a suitable target for wet weather because of the short-term nature of storms and problems that would result from combining wet and dry weather data, e.g., the USEPA criteria were based only on dry weather data. Discussion identified four location/time combinations that need to be considered overall:

	Dry	**Wet**
Beach	Geomean	?
Creek	Geomean?	?

The wet weather condition in particular requires further discussion. Chris Crompton (County of Orange) also said that creeks are different than beaches in important ways. For example, most creeks are now mostly dry and a significant percentage of the outlets to the beaches have been diverted. In addition, there are known locations where groundwater moves to surface water and can affect indicator concentrations.

Dry weather allowable exceedance frequency

The discussion of Slides #12 – 20 was less in depth because of time constraints. Jo Ann Weber (County of San Diego) said that sampling for human markers in addition to indicator bacteria would help to put the indicator data in context. Jeremy Haas (RWQCB) mentioned that the Board's Monitoring and Research Unit (MARU) is examining the potential of additional chemical markers of human influence. Jo Ann Weber (County of San Diego) was concerned about the possibility of continued requirements to meet TMDL targets even where human markers are absent, especially in creeks. She emphasized the importance of prioritizing human sources as part of the risk based approach. Chris Crompton (County of Orange) noted that Basin Plan Amendments are time consuming, which highlights the value of building flexibility into the language for this effort.

There was a brief discussion of the averaging period for the geometric mean and the number of samples needed (Slide #16). The statistical requirements indicate a minimum of 5 samples is needed, but USEPA's 2004 guidance said that 4 samples is adequate, but with some loss of statistical power. Jian Peng (County of Orange) suggested that it would be unwise to go below 30 days and 4 samples. There was general agreement, although not a formal decision, that 35 day and 5 sample, or 42 day and 6 sample, monitoring designs would work.

There is a disconnect between the TMDL and the permit in terms of the definition of dry weather (Slides #19 and 20) and there is a need to consider the implications of each definition and align them. This was identified as a parking lot item.

4. Next steps

See the Workgroup Action Items Report for a complete list of all action items and their status.

5. Next meeting date

The next workgroup meeting will be December 10, 2015, from 1:00 – 3:30 PM, per the agreed meeting schedule.

Attendees

Regional Board: Jeremy Haas, Michelle Mata, Jimmy Smith
San Diego City: Ruth Kolb
San Diego County: Todd Snyder, Jo Ann Weber
Orange County Public Works: Chris Crompton, Jian Peng
Team: Dustin Bambic, Clint Boschen, Ashli Desai, Chris Minton, Brock Bernstein

1. Introductions and Purpose of Meeting (9:30-9:35 am)

2. Meeting Notes, Action Items, Decision Points, and Parking Lot Review (9:35-10:00 am)

   a. Purpose: Review meeting notes from 10/29/15 meeting, action items and decisions. Discuss concept of parking lot list and add items if needed
   b. Handout: Meeting notes with action item, decision points, and parking lot tables
   c. Relevant studies: None
   d. Decisions: Agreement on meeting notes, action items and decisions

3. TMDL Targets-Discussion Item (10:00 am-12:30 pm)

   a. Purpose: Continued discussion of key decisions items presented at 9/10/15 meeting with focus on STV interpretation and calculation of geomean
   b. Handout: Background on STV and draft risk-based language
   c. Relevant studies: USEPA 2012 Criteria
   d. Decisions: May be outgrowth of discussion

4. Optional Item Background on TMDL Allocations (12:30-1:15 pm)

   a. Purpose: Information item to provide background on the TMDL allocation calculations in the current TMDL. This will set the stage for discussing the TMDL allocation approach in future meetings
   b. Handout: None
   c. Relevant studies: None
   d. Decisions: None

5. Next Steps (1:15 pm-1:30 pm)

San Diego Bacteria TMDL Workgroup Action Items Report

Key to status colors:
- Green indicates a completed deliverable
- Blue indicates greater than 30 days until the deliverable is due
- Yellow indicates a deliverable is due within 30 days
- Red indicates an overdue deliverable

Mtng Date	Deliverable	Assigned To	Due Date	Status	Comments
08/27/15	List of studies, completion dates, value added, implications for reopener	Consultant team	09/02/15	🟢	
08/27/15	Distribute draft cost sharing agreement	Todd Snyder	09/10/15	🟡	
08/27/15	Review past MOUs to assess whether useful concepts or language can be borrowed for this MOU	Drew Kleis, Ruth Kolb	09/10/15	🟡	
08/27/15	Discuss cost sharing agreement	Workgroup	09/10/15	🟡	
08/27/15	Finalize MOU	Workgroup	09/10/15	🟡	
08/27/15	Michelle Mata to meet with small group to review planned overall approach and its relationship to schedule; develop picture of how pieces fit in logical progression	Michelle Mata, Clint Boschen, Chris Minton, Ashli Desai, key permittees	10/7/15 meeting handout	🟢	
09/0/15	Evaluate implications of 32 vs. 36 illness rate using available monitoring data from creeks and beaches	Chris Minton, Dustin Bambic	10/7/15 meeting presentation	🟢	
09/10/15	Frame a more formal description of how a risk-based framework could be used in the TMDL	Ruth Kolb	10/7/15 meeting handout	🟢	
09/10/15	Develop options for calculating geomeans that account for varying intensities/frequencies of monitoring events	Chris Minton, Dustin Bambic	10/7/15 meeting presentation	🟢	
09/10/15	Expand the example table (single sample vs. STV) to include a column showing how the geomean compares to the single sample and STV results	Chris Minton, Dustin Bambic	Undefined, but soon	🟡	
09/10/15	Prepare a set of scenarios showing a range of comparisons across the options presented	Chris Minton, Dustin Bambic	10/7/15 meeting presentation	🟢	
10/07/15	Prepare background information on the basis for the 32	Chris Minton, Dustin	10/29/15 meeting	🟢	

	vs. 36 illness rates	Bambic			
10/07/15	Add language to draft TMDL targets memo to explain the applicability of the reference reach analysis in the risk-based framework	Chris Minton, Dustin Bambic	10/29/15 meeting	🟢	
10/07/15	Prepare a draft decision flow chart	Ashli Desai, Clint Boschen	10/29/15 meeting	🟢	
10/07/15	Prepare a draft Technical Report outline	Team	12/10/15 meeting	⚪	
10/29/15	Prepare background information on STV	Team	11/12/15	🟡	
10/29/15	Provide comments on draft decision flow chart and draft TMDL targets memo	RWQCB staff	11/6/15	🟡	
10/29/15	Provide revised TMDL targets memo and flow chart based on comments	Team	11/12/15	🟡	
11/19/15	Provide more detail on analyses needed to compare the two illness rates, along with cost and time estimate	Team			
11/19/15	Approach State Board about Workgroup meeting with them as a focus group	Jeremy Haas	12/10/15 meeting	🟡	
11/19/15	Examine the 13241 requirements to identify what information would be needed to address those	Team			
11/19/15	Add the caveat to the draft language that the 32 illness level is a "working assumption"	Team	12/10/15 meeting	🟡	
11/19/15	Describe the statistical background and rationale for the EPA 2012 criteria	Team			
11/19/15	Add a minor revision to the language in the alternative on Slide 7 to capture the potential for regional linkages	Team	12/10/15 meeting	🟡	
11/19/15	Develop ideas for prototypes or case studies of site-specific objectives that would illustrate different issues such as natural source exclusion	Team	TBD		longer term
11/19/15	Develop revised language related to allowable exceedance frequency	Team			
11/19/15	Prepare an explanation of "safe" in different contexts and what the implications could be for action in response to different types of monitoring outcomes	Team			

San Diego Bacteria TMDL Workgroup Decision Record

Number	Date	Decision	Type	Yes	No	Abstain
2015-1	09-02-15	Allow two weeks for review of meeting notes	Consensus			
2015-2	09-02-15	Michelle Mata to take on central coordinating role	Consensus			
2015-3	09-02-15	Materials for discussion/review distributed minimum of 10 calendar days before meeting	Consensus			
2015-4	09-02-15	Meeting agendas to include decision points, discussion lead, intended outcomes, and reference to background documents	Consensus			
2015-5	09-02-15	Use 9/10 meeting as trial run for planned approach to more detailed discussion	Consensus			
2015-6	09-10-15	Future discussions of methods for calculating exceedance rates and related topics will account for different settings (freshwater, marine, bays) where this has important implications for the policy	Consensus			
2015-7	10-07-15	Overall schedule of completion between December 2017 and April 2018 with target of September 2016 for technical report	Consensus			
2015-8	10-07-15	Documentation and justification of assumptions will be provided in technical report	Consensus			
2015-9	10-07-15	Use of risk-based framework is appropriate	Consensus			
2015-10	10-29-15	Both the 36 and the 32 per 1000 illness rates are scientifically defensible and the 32 per 1000 illness rate represents an incremental improvement in water quality in accordance with the 2012 USEPA criteria. The 32 per 1000 illness rate has been selected with the possibility of revision based on the results of the Cost Benefit Analysis and/or if the SWRCB selects the 36 per 1000 illness rate as part of the Revision of Bacterial Objectives.	County San Diego, City of San Diego and RWQCB agreed. Pending final agreement from Orange county			
2015-11	10-29-15	*E. Coli* as the single indicator for freshwater and Enterococcus as the single indicator for marine waters	Consensus			
2015-12	11-19-15	Documents be worded to reflect that the choice of the 32/1000 illness rate is a working assumption. Revises Decision #2015-10	Consensus			
2015-13	11-19-15	The geometric mean is an appropriate TMDL target for dry weather because it is a good indicator of the level of risk over time, but additional thought needs to be given to the details of monitoring, averaging period, etc. in order to best measure trends in risk over time	Consensus			

San Diego Bacteria TMDL Workgroup Parking Lot

Meeting Date	Issue	Tentative Meeting Date for discussion
9/10/15	Relationship of monitoring locations and procedures to compliance	TBD
10-29-15	Purpose of Cost Benefit Analysis Study and alternatives to be considered in the study	December or January
10-29-15	Need for 13241 analysis for proposed objectives	TBD
10-29-15	Methodologies for monitoring and analysis	TBD
10-29-15	Approach for addressing non-MS4 contributions (particularly wastewater) in TMDL	TBD
11-19-15	Align the definition of dry weather in the TMDL and the permit	TBD