Bryan Speegle, Director

COUNTY OF ORANGE

OC PUBLIC WORKS DEPARTMENT

Environmental Resources
1750 S. Douglass Road
Anaheim, CA 92806

Telephone: (714) 567-6363
Fax: (714) 567-6220

April 3, 2008

Mr. Wayne Chiu
San Diego Regional Water Quality Control Board
9174 Sky Park Court
San Diego, CA 92123-4340

Subject: **Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay – Draft Technical Report, February 22, 2008**

Dear Mr. Chiu:

The OC Public Works Department (OCPW), formally the County of Orange Resources and Development Management Department (RDMD), as a member of the Dana Point Harbor and San Diego Bay Bacteria TMDL Stakeholder Advisory Group (SAG), has reviewed the Total Maximum Daily Loads for Indicator Bacteria, Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in the San Diego Bay – Draft Technical Report and related appendicies, dated February 22, 2008. We appreciate the opportunity to provide comments on the most recent version of the TMDL document.

Overall, we support the efforts of Regional Board staff to develop a comprehensive and defensible technical underpinning for the development of the TMDL for bacteria at Baby Beach in Dana Point Harbor. We want to emphasize that, like the Regional Board, we remain committed to protecting the beneficial uses of waters in the Orange County area of the San Diego Region. Furthermore, we understand and appreciate the environmental, societal and economic impacts of bacteria impaired waters in the Region and place importance on the protection of the beneficial uses of waters within our jurisdiction.

As a member of the SAG, OCPW and the City of Dana Point have participated in the development of bacteria TMDL for Baby Beach since 2005. In this role, we have met with Regional Board staff and have reviewed and submitted comments on the each of the draft technical reports provided to the SAG. As you are aware, we also participated as a SAG member in the sister project to this TMDL, the Bacteria Impaired Waters TMDL Project I for Beaches and Creeks (Beaches and Creeks TMDL). Some of our previous comments on the Baby Beach TMDL (RDMD letter June 2, 2005) mirror our concerns on the Beaches and Creeks TMDL (RDMD letters dated April 16, 2004, February 2, 2006, September 18, 2006, April 19, 2007, July 25, 2007, and December 12, 2007). In particular, we do not feel that our previous comments regarding the modeling used to develop the load and waste load allocations have been addressed adequately. Further, there are unique and fundamental problems with the Baby Beach TMDL that need to be addressed to ensure that it is based upon the most accurate data available and justifies the expenditure of potentially significant public funds.

In general we believe that this most recent version of the TMDL still provides little acknowledgement of previous studies documenting the limited urban contributions and the

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extensive nature of the water quality improvement efforts at Baby Beach. These efforts have involved: sewer video and dye testing, storm drain seepage and groundwater studies, storm drain influence and sediment contamination studies, a recreational boat discharge study, microbial source tracking studies, circulation studies, maintenance of seasonal storm drain plugs, increased street sweeping, installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of Baby Beach harbor area water, storm drain diversion to the sanitary sewer, catch basin filter treatment systems, and the disposal of bird fecal droppings from the exposed intertidal areas of the beach.

As noted in this latest draft of the TMDL document, monitoring data from January 2002 to December 2006 has shown that levels of two indicator bacteria total and fecal coliform have, in the main, dropped to levels to recommend removal from the 303(d) list. This reduction is believed to be attributed to the efforts described above which have largely eliminated dry weather municipal MS4 sources through diversions and storm drain plugs. Despite this, and study findings pointing toward birds, sediment resuspension, and other natural sources as the likely source of impairment, the current version of the TMDL technical report still identifies the MS4 system as a significant source of dry weather impairment to Baby Beach and requires 82.7-96.2% (dependent upon specific indicator bacteria) wasteload reductions.

We have attached our prior comments dated June 2, 2005 (Attachment C). It should be noted that no response to these comments has been forthcoming. Technical comments on the February 22, 2008 Draft Technical Report are included in Attachment A. Below are several key issues that we believe are fundamental issues to be reconciled with the Baby Beach TMDL:

1) The lack of incorporation of recent Baby Beach water quality monitoring data from November 2002 to present in the Baby Beach TMDL model,

2) The lack of incorporation of extensive data collected as part of the June 2003 State of Beach Report (funded through the state Clean Beaches Initiative), which includes data mining, a circulation study, and special bacteriological studies conducted at Baby Beach,

3) The failure of the Baby Beach TMDL model to take into account dry weather plugs inserted into the storm drains at Baby Beach from 1997-2002 and ongoing storm drain diversion and treatment BMPs.

4) The inaccuracy of the watershed boundary and resulting land use category calculations used. The Baby Beach TMDL model uses a grossly overestimated watershed area of 522.6 acres to model land use derived bacteria loading from the MS4 system. Grading and development plans indicate only 43.4 acres drain directly to Baby Beach (see also Attachment A, Comment #5 and Attachment B, Baby Beach Drainage Area Map),

5) The use of apparent old bathymetry as the basis of the Baby Beach TMDL receiving water model. The bathymetry data used for Dana Point Harbor does not correspond with the time period used for model calibration (see also Attachment A, Comment #9).

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In light of OCPW's and the City of Dana Point's previous and ongoing efforts to control bacteria sources at Baby Beach and study findings that point toward natural sources of impairment, we feel that the proposed TMDL does not reflect the current situation at Baby Beach. To address this, we suggest that the TMDL model be updated to incorporate the most recent water quality, circulation, and bacteriological study data, previous and ongoing BMP efforts, and include the correct drainage area to Baby Beach and bathymetry data for Dana Point Harbor. With the incorporation of these updates we believe the developed TMDLs will more correctly reflect site conditions, the sources of impairment at Baby Beach, and better direct public funds towards meaningful beneficial use enhancement efforts.

Thank you again for the opportunity to provide comments on this important technical document. If you have any questions regarding these comments, please call Amanda Carr at 714-567-6367.

Very truly yours,

Chris Crompton, Manager
Environmental Resources Section

cc: Julie Chan, San Diego Regional Water Quality Control Board
        Dana Point Harbor and San Diego Bay Bacteria TMDL Stakeholder Advisory Group
        Members

Attachments:
A. Technical comments on February 22, 2008 draft report
B. Baby Beach Drainage Area Map
C. Previous technical comments on April 19, 2005 draft report

Attachment A
Technical Comments on Total Maximum Daily Loads for Indicator Bacteria,
Baby Beach in Dana Point Harbor and Shelter Island Shoreline Park in San Diego Bay
Draft Technical Report, February 22, 2008

1.   Executive Summary, Page 1, Third Paragraph: The TMDLs established in this
      technical report relate to water quality objectives for REC-1 and REC-2 beneficial
      uses not shellfish harvesting. As noted in the third paragraph, SHELL beneficial
      use will be addressed in a separate TMDL and/or standards action. To prevent
      confusion to the reader, references to shellfish harvesting beneficial uses should
      be removed from the document.

2.   Section 1 Introduction, Page 5, Second Paragraph: The document states, "The
      bacteria loads from the watershed were used as inputs into a second model used
      to calculate the assimilative capacity of receiving waters at the impaired BB and
      SISP shorelines". This text should be revised to reflect that the bacteria loads
      were modeled based upon land use area and that the actual bacteria loads from
      the MS4 systems are not known.

3.   Section 1.1 Technical Approach, Page 7, Fifth Paragraph: The document states,
      "For these TMDLs, the receiving waters are the impaired shoreline segments of
      BB and SISP, and the watersheds are the areas of the watershed that drain
      directly to those receiving waters." This does not match with text in other parts of
      the document which define the watershed area for Baby Beach as 522.6 acres or
      the entire watershed for Dana Point Harbor and not just the watershed area to
      the impaired shoreline segment of Baby Beach.

4.   Section 2.1 Project Area Description, Page 11, Second Paragraph: The
      document states, "Impairment of these shorelines is likely due to local sources of
      bacteria such as human, domestic animals and urban runoff." This statement
      does not appear to be correct based upon 2003 studies and conflicts with the text
      in Section 5.1.1 Natural Sources, Page 26, Third Paragraph, which states that for
      both wet and dry weather fecal bacteria deposited from waterfowl may be the
      primary source or a relatively significant source of impacts to the shorelines.

5.   Section 2.1 Project Area Description, Page 11, Fourth Paragraph: The 522.6
      acre watershed described in Table 2-1 includes drainages for all of Dana Point
      Harbor. This is an incorrect depiction of the drainages to the Baby Beach
      shoreline.   A review of grading and development plans (Dana Point Headlands
      Project Hydrology Exhibit, Stantec Consultants, Inc. 2/15/2007, Ocean Institute
      BMP Evaluation Site Plan, RDMD 11/26/2002, Dana Point Harbor Parking Lot
      No. 2 Grading and Paving Plan, Koebig & Koebig, Inc. September 1971), for the
      area surrounding Baby Beach defines a drainage area of only 43.4 acres (see
      Attachment B). In addition, harbor water quality monitoring data and circulation
      studies indicate that bacteria impairment is confined to the Baby Beach shoreline
      and that limited circulation exists between the waters near to Baby Beach and
      the waters further in the harbor channel. The Baby Beach bacteria TMDLs were
      developed based upon modeling results driven by watershed size and land use.
      The use of a watershed area representative of the actual inputs that drain to the
      segment of impaired shoreline is imperative to accurate model TMDL

development. The watershed area used in the model should be revised to reflect the actual drainage area to Baby Beach and the TMDLs should be revised accordingly.

6.   Section 2.3 Impairment Overview, Page 15, Second Paragraph: The document states, "For this project, the most recent water quality data available at the time of the model development in 2004 were used to develop the models." Based upon the data sources listed in Appendix D only Baby Beach water quality data from 11/1996-10/2002 was used. Therefore, water quality data from 10/2002 to 2004 was not used and neither was the extensive data collected as part of the June 2003 State of Beach Report which included a data mining study, circulation study, and special bacterialogical studies conducted at Baby Beach. The document should be revised to reflect what data was actually used for modeling. This comment also applies to document text in Section 4.1.1, Page 20, First Paragraph.

7.   Section 3, Numeric Target Selection, Page 17: Similar to the Bacteria Impaired Waters – Project I Beaches and Creeks TMDL, this section of the document should be revised to include reference to the pending Reference System & Antidegradation Approach (RSAA) and Natural Sources Exclusion Approach (NSEA) Basin Plan Amendment (BPA) and explain its implications to the Baby Beach and Shelter Island Shoreline Park TMDLs. In particular, the NSEA seems appropriate to the situation at Baby Beach were studies point toward birds, sediment resuspension, and other natural sources as the likely source of impairment.

8.   Section 4.1.2 Waterbody Characteristics, Page 20, Third Paragraph: The hydrology component of the model developed as part of the Bacteria TMDL Project I and now utilized as part of the San Diego Bay and Dana Point Harbor TMDLs involved a calibration using thirteen USGS gages throughout the San Diego Region for wet weather and a combination of gage data from a tributary to San Juan Creek and instantaneous flow measurements from stations in Aliso Creek and Mission Bay drainages for dry weather. The use of these data sources is inappropriate for determining loading and TMDLs for Baby Beach for the following reasons:

a) The thirteen USGS gage stations are located along much larger drainages (13,632 - 462,720 acres) that have different hydrology than the small storm drain system at Baby Beach (43.4 acres). Factors such as ground water input within a creek and longer wet weather sustained flows are not components of a small, concrete lined, underground MS4 system like the one found at Baby Beach. In addition, many of the USGS gage stations used have upstream reservoirs and lakes that may regulate or partially regulate flow. This adds another layer of uncertainly to using this data to simulate flows in a small MS4 system.

b) The instantaneous flow data used from the Aliso Creek Watershed was only "estimated" flow. Caution should be taken in using this data because the methods used to determine flow (e.g. the floating leaf method) have inherent error. The fact that these flow approximations were used to develop a regional model and that these models were used to develop TMDLs is a concern.

To address these two issues a better description of the limitations of the flow data used to develop these models should be presented in the document. In addition, some recent flow data is available from the diversion system BMP in place for the Dana Point Headlands area which drains to the west end of Baby Beach. This data could be used to calibrate model derived dry weather flows to those actually observed within the Baby Beach drainage area.

9.   Section 4.1.2 Waterbody Characteristics, Page 21, First Paragraph: More information should be provided regarding the resolution and the date of the bathymetry data used for Baby Beach. The USGS DRG 7.5 min quadrangle map for Dana Point provides some limited data on depth curves and depth sounding locations for coastal areas, but dates back to 1975 and does not provide detailed bathymetry. The use of this data to create an accurate receiving water model for Dana Point Harbor does not seem appropriate. In addition, dredging is regularly performed in the harbor every 5-7 years to maintain navigable depths and widths making it uncertain whether the data used reflects the conditions during the time period of the water quality modeling data used. More accurate Dana Point Harbor bathymetry data is and has been available from the County and should be used to update the receiving water model.

10.   Section 5 Source Analysis, Page 25, Second Paragraph, Last Line: Remove extra "s" after approaches.

11.   Section 5.1 Nonpoint Sources, Page 25, Fourth Paragraph: Homeless encampments are not believed to be a source of impairment to Baby Beach by either the County or City of Dana Point. Additional justification and information should be provided to support the statement that encampments from homeless persons is a potential nonpoint source of bacteria at Baby Beach or the document should be revised removing homeless encampments as a potential source.

12.   Section 5.1.1 Natural Sources, Page 26, Fourth Paragraph: This section of the document does not identify wrack line or sediment regrowth as potential nonpoint sources of bacteria. As noted later in the document, (Section 10.7.2, Page 77, Paragraph 2) studies have found that bacteria multiply in the wrack line on the beach during low tide and this can cause exceedances during high tide when the wrack is inundated. The June 2003 State of the Beach Report for Baby Beach and continued studies by the Orange County Health Care Agency have also identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach. Descriptions of both these natural sources should be added to this section of the document.

13.   Section 5.1.2 Encampments (Homeless Persons), Page 26, Fifth Paragraph: See comment #11.

14.   Section 5.2.3 Municipal Separate Storm Sewer Systems (Urban Runoff), Pages 27 & 28, Last Paragraph: Please clarify if the "direct linkage" that has been established between human illness and recreating near the outfalls of urban stormwater conveyance systems is applicable to the Baby Beach situation where there are no sewage inputs or whether the said study was conducted in areas

where sewage inputs were quantified and therefore is not applicable to this area. The reference provided for this are issued permits not scientific studies.

15.   Section 6.1.1.2 Source Contributions, Page 31, Fourth Paragraph: Correct typographical error "poosible".

16.   Section 7.2.3 Dry Weather Load Calculations, Page 43, Second Paragraph: The analysis of dry weather load calculations does not take into account that the west end and east end storm drains to Baby Beach were plugged with inflatable seals during the dry season from 1997-2002. The TMDL model utilized Baby Beach water quality data from 11/1996-10/2002 for calibration. This data was collected during the period the plugs were in place, therefore, its use for the calibration of watershed MS4 systems loading into Baby Beach is flawed. Dry weather load calculations should be adjusted to reflect site conditions (no MS4 inputs) during the modeling data period.

17.   Section 7.2.5 Calculation of Existing Dry Weather Bacteria Loads and TMDLs, Page 45, Second Paragraph: If modeling indicates that watershed bacteria levels were too low to result in the observed bacteria levels and Baby Beach storm drains were plugged during the model utilized data period (Comment #16), then it would seem uncertain that the required MS4 wasteload reductions would result in meeting the assimilative capacities or WQOs at Baby Beach. As noted in Comment #16, the dry weather model should be adjusted to reflect the site conditions at the time of the water quality monitoring data used and the required dry weather load reductions should be revised accordingly.

18.   Section 8.2 Load Allocations, Page 49, Third Paragraph: Better spatial information is available for the coverage of MS4s in the Baby Beach drainage area. Attachment B depicts the Baby Beach drainage area and MS4 subdrainages within it based upon a review of area grading and development plans. As noted in Comment #5, the watershed area used in the model should be revised to reflect the actual drainage area to Baby Beach. A redistribution of WLAs assigned to MS4s should be calculated to account for natural areas not included within coverage of an MS4.

19.   Section 9.4 Persons Responsible for Controllable Nonpoint Source Discharges, Page 60, Second Paragraph: See comment #11 regarding encampments of homeless persons.

20.   Section 10.3.1 Point Source Discharges, Page 63, Table 10-1: San Diego Water Board Order No. R-9-2008-0001 has not been adopted. The citation should be revised to reflect the current NPDES permit No. R-9-2002-0001.

21.   Section 10.4.1 Compliance Schedule, Page 65, Second Paragraph: For over ten years the OC Public Works Department (formally RDMD) and the Orange County Health Care Agency have conducted numerous studies and implemented a variety BMPs in an effort to reduce bacteria levels at Baby Beach. These efforts have included seasonal plugs in storm drains, increased street sweeping efforts, the installation of bird netting under the pier, public education efforts against bird-feeding at the beach, artificial circulation of Baby Beach harbor area water, a dry weather flow diversion structure on the west end of the beach, catch basin filter

treatment systems, and the disposal of bird fecal droppings from the exposed intertidal areas of the beach. The document should be revised to describe implemented BMPs and to change text indicating that a dry weather flow diversion structure is at the <u>west</u> end storm drain not the east end.

22.   Section 10.6 Specific Implementation Objectives, Page 75, Third Paragraph. See comment #20.

23.   Appendix B, Comment13, Page B-14: We believe that Professor Holden's comment that, "the miniscule amounts to be removed from the watershed will likely do little to protect public health" defines an underlying problem with the developed TMDLs. Considering that during dry weather the Baby Beach storm drains were plugged during the period of data used for modeling it is difficult to give any validity to the dry weather MS4 TMDLs or the actual assimilative capacity of Dana Point Harbor. The Regional Board's response to professor Holden's comment should be revised to reflect the MS4 conditions during the period of modeling.

24.   Appendix B, Overarching Questions, Page B-14: Professor Holden makes a significant comment that, "the development of TMDLs and the implementation of them against a backdrop of great uncertainty regarding their effectiveness to protect human health represents an unwise expenditure of public funds." Although there may currently be limited data evaluating the human health risks associated with bacteria from waterfowl (continuing epidemiological studies this summer at Doheny Beach may shed light on this), there is considerable data regarding the source of bacteria at Baby Beach which can improve the developed TMDLs to more correctly reflect site conditions. As noted previously, the Baby Beach storm drains were plugged during the period of data used for modeling. Therefore, we believe that this creates great uncertainty as to developed TMDL and whether it will do anything to protect public health beyond current ongoing efforts.

25.   Appendix B, Overarching Questions, Page B-26, Comment: Professor Barber makes a significant comment that, "there are many data gaps that required assumptions that will eventually need to be proven in order to justify the expected costs associated with the implementation plan." A "lack of data" is used repeatedly throughout the document as a reason for model assumptions. As noted previously, additional monitoring and study data which could improve these TMDL models is and has been available at Baby Beach. Considering the unknown implementation costs of these TMDLs and the fact that current data has not been used to improve the modeling, her comment clearly points to the need to update the modeling.

26.   Appendix F, Section F.3.3.2.2, Lateral boundary conditions, Page F-40, Fourth Paragraph: The document states, "Contributions from subwatersheds 2101 and 2102 were included as lateral boundary conditions for DPH." This seems to contradict other information in the document (Table 2-1 and Figure J-3) that describe and depict the Baby Beach watersheds as being 522.6 acres and subwatersheds 2101, 2102, 2103, and 2104. If only subwatersheds 2101 and 2102 were used for modeling loading, this would include approximately 195.7 acres. This is still over four times larger than the 43.4 acres shown on area
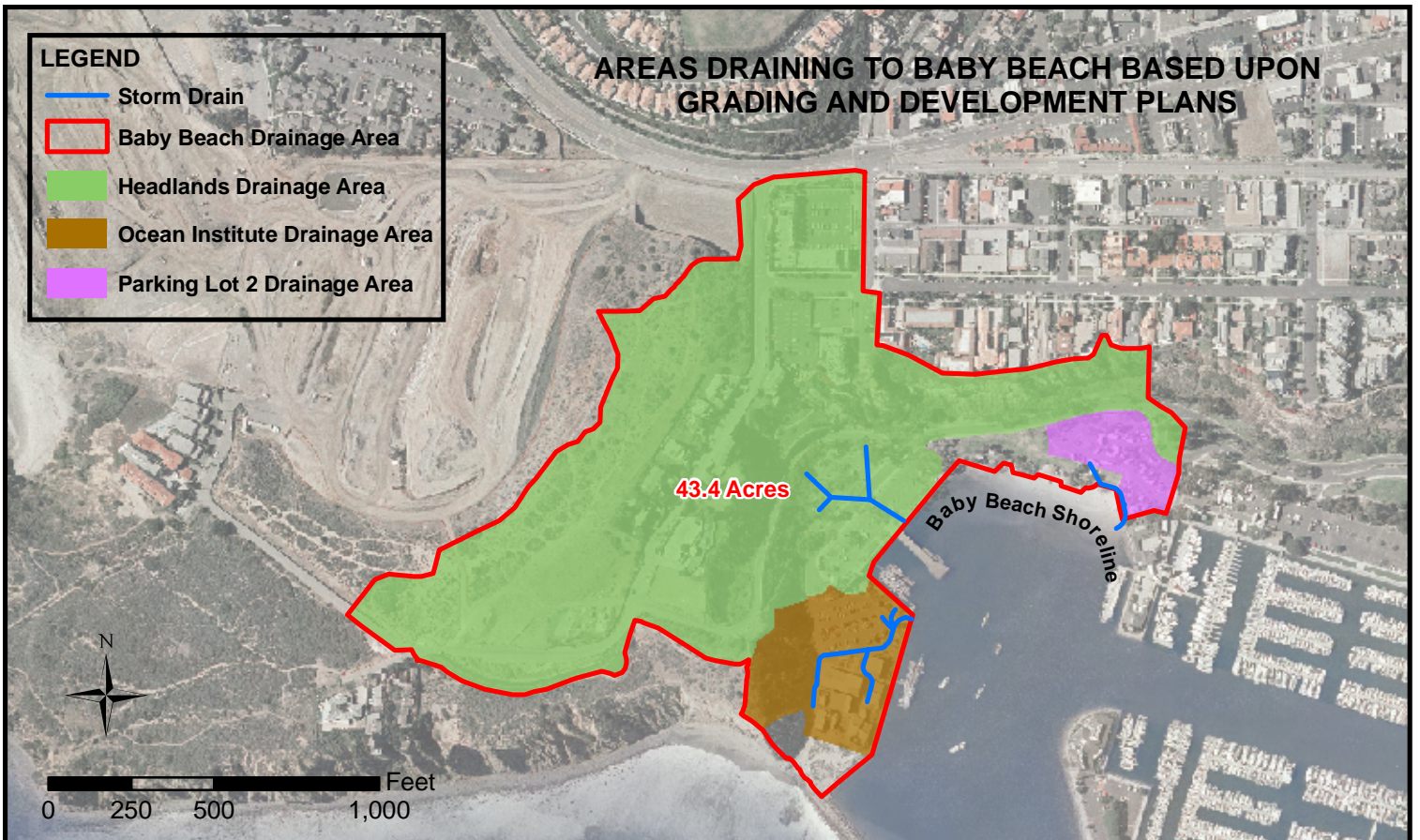
grading and development plans as draining directly to Baby Beach (see Comment #5).
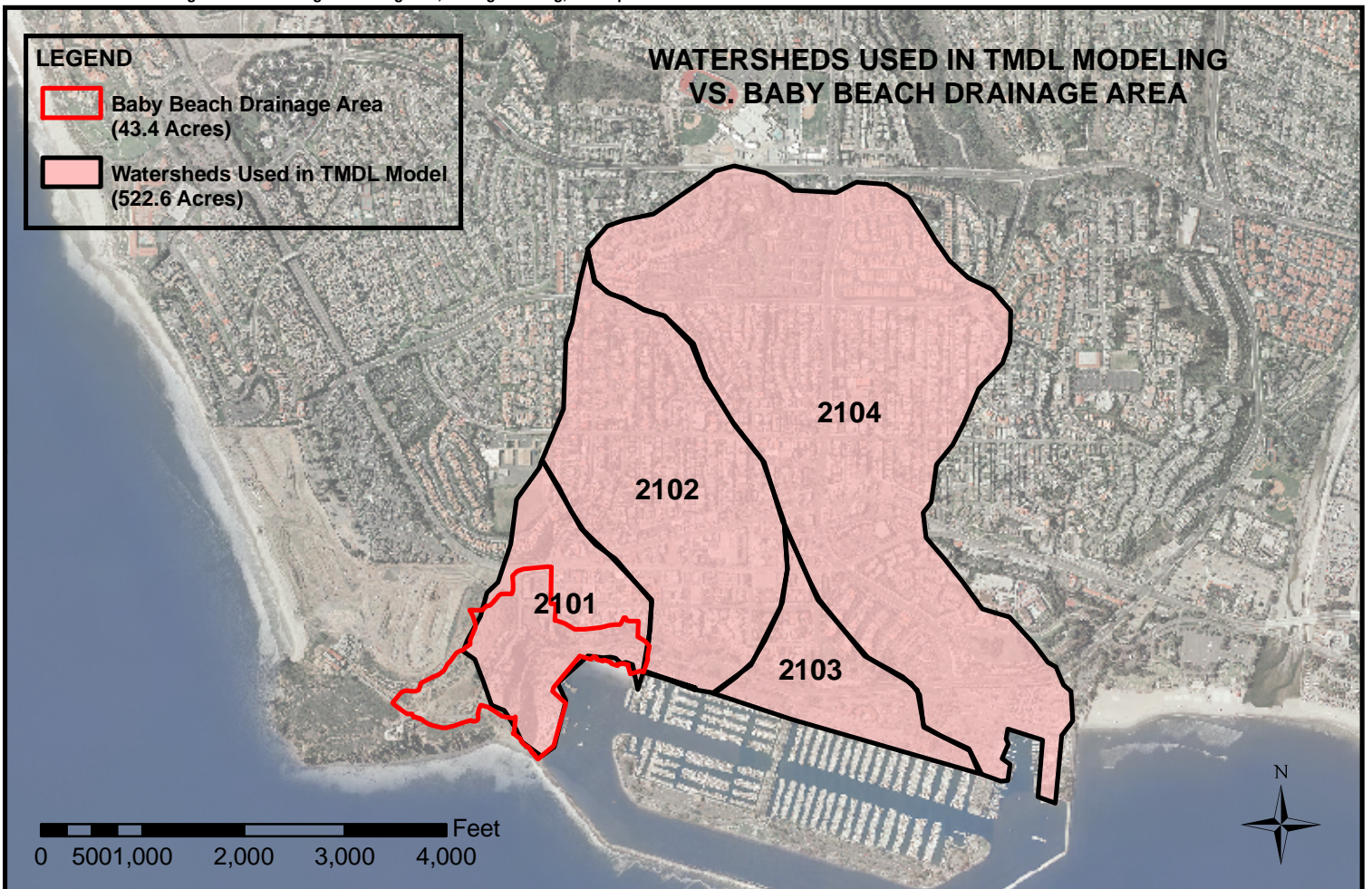
27.   Appendix J, Figure J-3, Dana Point Harbor – Baby Beach Watersheds, Page J-3: The map area highlighted as being "impaired waterbody" extends beyond the east end of Baby Beach and around into the west basin of the harbor. This is an incorrect depiction of the impaired area of the harbor. The map should be revised to reflect impaired area being confined to Baby Beach.

AREAS DRAINING TO BABY BEACH BASED UPON GRADING AND DEVELOPMENT PLANS

LEGEND
- Storm Drain
- Baby Beach Drainage Area
- Headlands Drainage Area
- Ocean Institute Drainage Area
- Parking Lot 2 Drainage Area

43.4 Acres

Baby Beach Shoreline

N

Feet
0   250   500   1,000

Data Sources: Dana Point Headlands Project Hydrology Exhibit, Stantec Consultants, Inc. 2/15/2007, Ocean Institute BMP Evaluation Site Plan, RDMD 11/26/2002,   Aerial Source: Eagle Aerial 2007
Dana Point Harbor Parking Lot No. 2 Grading and Paving Plan, Koebig & Koebig, Inc. September 1971

WATERSHEDS USED IN TMDL MODELING VS. BABY BEACH DRAINAGE AREA

LEGEND
- Baby Beach Drainage Area (43.4 Acres)
- Watersheds Used in TMDL Model (522.6 Acres)

2104

2102

2101

2103

N

Feet
0   500 1,000   2,000   3,000   4,000

COUNTY OF ORANGE

RESOURCES & DEVELOPMENT MANAGEMENT DEPARTMENT

Environmental Resources
1750 S. Douglass Road
Anaheim, CA 92806

Telephone: (714) 567-6363
Fax: (714) 567-6220

June 2, 2005

Julie Chan
San Diego Regional Water Quality Control Board
9174 Sky Park Court, Suite 100
San Diego, CA 92123-4340

Subject: **Total Maximum Daily Loads for Bacteria at San Diego Bay and Dana Point Harbor Shorelines – Technical Draft, April 19, 2005**

Dear Ms. Chan:

The County of Orange Resources and Development Management Department, as a member of the San Diego Bay and Dana Point Harbor Bacteria TMDL Stakeholder Advisory Group (SAG), has reviewed the Total Maximum Daily Loads for Bacteria at San Diego Bay and Dana Point Harbor Shorelines – Technical Draft, April 19, 2005 (Technical Draft) and appreciates this opportunity to provide comments on the proposed document.

Overall, we support the efforts of Regional Board staff to develop a comprehensive and defensible technical underpinning for the development of the TMDLs for Bacteria at San Diego Bay and Dana Point Harbor shorelines. We remain committed to protecting the beneficial uses of the beaches and creeks within our jurisdiction and look forward to working with you and your staff on reasonable and practical solutions to real impairments.

Regarding the Technical Draft, our primary concern relates to the reliance of the San Diego Bay (SDB) and Dana Point Harbor (DPH) model on the model developed for Bacteria-Impaired Waters TMDL Project I for Beaches and Creeks in the San Diego Region. The County submitted extensive and substantive comments on the calibration of the Project I model on April 16, 2004. These comments have been discussed with Regional Board staff, but not formally incorporated into the model or the Project I Technical Draft. The April 16, 2004 comments also apply to the model described in the SDB and DPH Technical Draft and are specifically referenced where appropriate in our comments listed below:

1. Section 4.1 Data Inventory, page 11: The text should list the specific reports utilized that corresponds to each data source. From the current text it is difficult to determine if the extensive data collected in the June 2003 State of the Beach Report was included in the model. This project was funded through the Clean Beaches Initiative and includes a thorough data mining report, circulation study and special bacteriological studies conducted during the summer and fall of 2002. Without utilizing this data, it is doubtful that the model accurately approximates the bacterial influences at Baby Beach.

2. Section 5.1 Nonpoint Sources, Page 18: The text does not identify sediments as a potential nonpoint source of bacteria. The June 2003 State of the Beach Report and continued studies by County of Orange Health Care Agency have identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach.

3. Section 5.2.2.b Dry Weather Urban Runoff: The analysis of dry weather urban runoff does not take into account the fact that all storm drains leading to Baby Beach are plugged from May through September since 200X, eliminating the influence of urban runoff during this season. Without incorporating this information, it is doubtful that the model accurately approximates the bacterial influences at Baby Beach.

4. Section 6.1.1.d Constituents, Page 23: The text should define the term "state variable".

5. Section 6.2 Wet-weather Modeling Analysis, Page 24: The model does not address re-growth of bacteria within the system. The June 2003 State of the Beach Report and continued studies by County of Orange Health Care Agency have identified bacteria resuspension and regrowth in sediments as an important potential source of bacterial contamination at Baby Beach.

6. Section 7.2.1 Identification of the Critical Dry-weather Condition, Page 31: The text should clarify whether the tidal regime chosen for both the wet-weather and dry-weather has actually occurred during those periods. It is unclear whether the chosen critical tidal regime would occur during both wet and dry seasons. The text should also include the rationale for what factors characterize a critical tidal condition.

7. Appendix G, Introduction, Page 1, Second Paragraph: The discussion of near shore contributions of bacteria should include a discussion of bather shedding of bacteria. Nearshore contributions in some cases where there is high-density human use can be due to shedding from humans (especially infants and children). The name of the impaired waterbody in Dana Point Harbor (Baby Beach) suggests that there is a high degree of use by children.

8. Appendix G, Introduction, Page 1, Third Paragraph: The modeling approach described does not capture the transformations bacteria undergo, i.e., dieoff due to exposure to ultraviolet radiation and saline conditions, and regrowth where conditions are favorable. These dynamics make a simple buildup and washoff model prone to higher degrees of error and uncertainty. Some recent data suggest that regrowth of bacteria can happen fairly quickly.

9. Appendix G, Introduction, Page 1, Fifth Paragraph: Substantive concerns were raised about the degree to which these models were calibrated. For example, see comments 19 – 32 and 35 – 38 in the County's April 16, 2005 comment letter on TMDL Project 1.

10. Appendix G, G.1.1 Watershed Segmentation, Second Paragraph: In order to evaluate whether the hydraulic assumptions in the model are accurate, it's important to know whether the streams and channels that input to the impaired areas really behave like pipes. If there are places where there are eddies, backflows, pooling, or other features that do not reflect direct flow, then the hydraulic assumptions of the model will not be representative.

11. Appendix G, G.1.2 d Pollutant Representation: See comment #3 above, in particular comments 19 – 24, 26, 28, and 35 in the April 16 comment letter. The buildup and washoff approach to bacteria loading should be explained more fully to make clear whether the buildup algorithm allows for dieoff of bacteria as they sit on the land surface exposed to sunlight. In addition, the document should clarify whether the buildup algorithm treats all surfaces as impervious, or whether it allows for flushing of coliforms that are naturally resident in soils, a different physical process from washoff of an impervious surface.

12. Appendix G, G.1.2 e Waterbody Representation: The document states, "Each delineated subwatershed was represented with a single stream assumed to be completely mixed, one-dimensional segment with a trapezoidal cross-section." That may be a reasonable assumption if all the inputs to the listed areas are in fact concrete lined channels. However, if they are natural streams, or channels with earthen sides or

bottoms, there could be major problems with this assumption. In addition, many channels have accumulated sediment and vegetation, and some have dikes to promote infiltration for groundwater recharge. Any of these factors could undermine the validity of the modeling results. While models do have to make simplifying assumptions, it's important not to take these to the point where the model is no longer a reasonable representation of the system. It would be useful to validate this assumption by comparing actual measured flows to modeled flows in a channel that clearly does not meet the assumption that the channel is essentially a well-mixed pipe.

13. Appendix G, G.1.2 e Waterbody Representation: The document does not state the criteria for determining representativeness. The document should describe how well the approximated GIS-based reach reflects the actual range of stream and channel characteristics found in the DPH and SDB sub-watersheds. Without this information, a determination whether the reaches were selected because they are representative of actual stream characteristics or because they meet the modeling assumptions cannot be made.

14. Appendix G, G.1.3 a Hydrology Calibration and Validation: See comment #3 above, in particular comments 19 – 22 in the April 16 comment letter.

15. Appendix G, G 1.3 b Water Quality Calibration and Validation: See comment #3 above, in particular comments 19 – 24, 26, 28 – 29, and 31 – 32 in the April 16 comment letter.

16. Appendix G, G.1.3 b Water Quality Calibration and Validation: The document states, "no data are available for the bay and harbor watersheds to further validate the parameters as part of this current modeling effort." This is a serious data gap. These watersheds may well behave differently than the other coastal watersheds that were the focus of TMDL Project 1. As just one example, the mixing dynamics at the mouth of the watershed will be different. Tidal influences and mixing in a bay are going to be very different than along the open coast. The amount of dispersion and dilution will be different, as will conditions that determine dieoff and/or regrowth rates. Human use patterns will also be different, and, to the extent that direct shedding by humans is a significant source, this could be an important difference. Without watershed specific data to validate the parameters of the model, the results of the model are at best questionable and should not be used as the basis of major policy decisions or implementation plans.

17. Appendix G, G. 2 Dry Weather Watershed Model: See comment #3 above, in particular comments 19, 21 – 26, 28 – 32, and 35 - 38 in the April 16 comment letter.

18. Appendix G, G. 2 Dry Weather Watershed Model: The document states, "This predictive model represents the streams as a series of plug-flow reactors, with each reactor having a constant, steady-state flow and pollutant load." This representation may not be not adequate for dry weather flow. Patterns of bacteria concentrations are not well represented by steady-state mass balance assumptions, as previous work on Aliso Creek has demonstrated.

19. Appendix G, G.2.1 Model Configuration: The document should state on what basis are bacteria presumed to be conservative, and how are dieoff and regrowth processes are or are not accounted for within the model.

20. Appendix G, G.2.1 b Conceptual Representation: The document should state the loss rate used in the model and the basis for the chosen rate.

21. Appendix G, G.2.1 b Conceptual Representation: The described approach is suitable for dealing with a large number of streams and coming up with representative, or average, predictions. However, in Dana Point Harbor, there are only a few inputs to the system and, future BMPs to meet the TMDL targets are going to be very site-specific in nature. Further, the degree to which TMDL targets are being met will be assessed on the basis of bacteria concentrations monitored at specific locations. This situation will result in site-
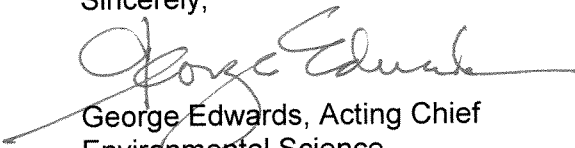
specific monitoring being compared to TMDL targets generated on the basis of regional characterizations of highly simplified channel morphologies. The TMDL targets should be generated using site-specific information.

22. Appendix G, G.2.2 Estimation of Dry-Weather Runoff: See comment #3 above, in particular comments 19, 21 – 26, 28 – 32, and 35 - 38 in the April 16 comment letter.

23. Appendix G, G.2.2 Estimation of Dry-Weather Runoff: The document identifies 13 land use types and states the statistical relationship established between each land use area and flow showed good correlation. However, there were good correlations between land use type and flow for only three of the identified land uses. The document needs to provide justification for the broad claim that land use area and flow show good correlation.

24. Appendix G, G.2.3 Estimation of Bacteria Densities: See comment #3 above, in particular comments 19 – 24, 35, and 37 – 38 in the April 16 comment letter.

We look forward to continuing participation in the cooperative and collaborative efforts led by Regional Board staff on the development of this TMDL and the subsequent implementation plan.

Thank you again for the opportunity to provide comments on the Technical Draft document. If you have any questions regarding these comments, please call Amanda Carr at 714-567-6367.

Sincerely,

George Edwards, Acting Chief
Environmental Science

cc: Lesley Dobalian, San Diego Regional Water Quality Control Board