CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

May 10, 2018
Resolution No. R18-0XX

A Resolution to Prioritize Actions to Adapt to and Mitigate the Impacts of Climate Change on the Los Angeles Region's Water Resources and Associated Beneficial Uses

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WHEREAS, the California Regional Water Quality Control Board, Los Angeles Region (Los Angeles Water Board), finds that:

1. The mission of the Los Angeles Water Board is to preserve and enhance water quality in the Los Angeles Region for the benefit of present and future generations. Pursuant to the federal Clean Water Act and the California Porter-Cologne Water Quality Control Act, the Board designates beneficial uses of the Region's surface and ground waters and establishes water quality objectives for the reasonable protection of those uses. Beneficial uses are the uses of water necessary for the survival or well-being of humans, plants, and wildlife. In the face of climate change, the Board's success in achieving its mission requires a clear understanding of the foreseeable impacts to our water resources and associated beneficial uses and implementation of strategies to adapt to and mitigate such impacts.

2. Human activities over the past century have resulted in the release of large quantities of carbon dioxide and other greenhouse gases (GHG) into the atmosphere, leading to the onset of significant changes in the earth's climate that will have substantial impacts on water resources, including water quality.

3. As discussed in detail in Part 1 of the Los Angeles Region Framework for Climate Change Adaptation and Mitigation - *Current State of Knowledge & Water Quality Regulatory Program Considerations* discussed below, ~~T~~the predicted increase in temperature, heightened frequency of extreme weather conditions including extreme precipitation events and drought, and resultant increase in the occurrence of flooding and wildfires, along with sea level rise could drastically alter hydrological and ecosystem processes in our region. Potential impacts include decreases in stream flow overall, together with potential for increased short-term rapid increases in flow following precipitation events that can cause scour and erosion; reductions in, and changes to, aquatic habitats; increases in surface water temperature; increases in sedimentation (resulting from flooding and wildfires followed by post-fire rain and mudslides), pollutant levels (resulting from increased sedimentation and sediment-bound pollutants, decreased streamflow, ~~and~~

potential facilities overflow/inundation, and release of chemicals used for fighting wildfires), and algal growth; increased coastal erosion; and ocean acidification.

4. These impacts will likely affect many beneficial uses, including aquatic and riparian habitats and associated species, as well as municipal supply, recreational and commercial uses.

5. Impacts to municipal supply and recreational uses, such as the potential increase in the occurrence of harmful algal blooms or sewer overflows, heighten risks to public health.

6. Communities that are socially or economically disadvantaged are especially vulnerable to climate change impacts, due for example to limited access to clean and affordable water; lack of proper infrastructure to deal with extreme weather events and the economic resources necessary to prepare and respond to these events; proximity of environmental hazards; and lack of shade cover that heightens the risk of the urban heat island effect. In addition, beach erosion will affect disadvantaged communities for which public beaches are the most significant form of coastal access and recreation.

7. The State's adaptation strategy, Safeguarding California, provides a roadmap for state government action to build climate change resiliency. It identifies seven overarching principles that represent foundational objectives for California's approach to climate change adaptation:

    a. Consider climate change in all functions of government;
    b. Partner with California's most vulnerable populations to increase equity and resilience through investments, planning, research, and education;
    c. Support continued climate research and data tools;
    d. Identify significant and sustainable funding sources to reduce climate risks, harm to people, and disaster spending;
    e. Prioritize natural infrastructure solutions that build climate preparedness, reduce greenhouse gas emissions, and produce other multiple benefits;
    f. Promote collaborative adaptation processes with federal, local, tribal, and regional government partners;
    g. Increase investment in climate change vulnerability assessments of critical built infrastructure systems.

8. On March 7, 2017, the State Water Resources Control Board (State Water Board) adopted a *Comprehensive Response to Climate Change* resolution directing a proactive approach to climate change in all Board actions, including drinking water regulation, water quality protection, and financial assistance (~~Resolution No. 2017-0012~~State Water Board Resolution No. 2017-0012). The resolution lays the foundation for a response to climate change that is integrated into all State Water Board actions, by giving direction to the State Board divisions, and encouraging coordination with the Regional Water Boards.

9. Regionally, the Los Angeles Water Board started a focused consideration of climate change issues in 2014, and included the development of a regional climate change strategy as a priority project during the 2014-2016 triennial review period.

10. Overall, the Los Angeles Water Board's climate change strategy aims to protect beneficial uses and water quality under a changing climate, while achieving the following goals:

    - Improve ecosystem resilience;
    - Protect and improve the resilience of coastal and inland infrastructure;
    - Promote wastewater recycling, stormwater capture and groundwater recharge;
    - Promote sustainable watershed management;
    - Expand monitoring and research to track the effects of climate change and the effectiveness of mitigation measures, and
    - Protect vulnerable communities.

11. In July 2015, the Los Angeles Water Board published Part 1 of the Los Angeles Region Framework for Climate Change Adaptation and Mitigation - *Current State of Knowledge & Water Quality Regulatory Program Considerations*. The document presents the current state of climate change science in the region, contemplates the impacts of climate change on water quality and beneficial uses, and begins to identify and define issues that will need to be considered and addressed over time.

12. On February 11, 2016, Board management organized an information item to share with the Board and stakeholders the results of the latest research on regional climate change effects. Dr. Alex Hall (UCLA), Dr. Patrick Barnard (USGS) and Dr. Juliette Hart (USC) summarized the results of local models describing the effects of climate change on temperature, precipitation patterns, runoff and snowpack in the Los Angeles Region, as well as the potential impacts of sea level rise and storms in coastal zones. Board staff and the presenters discussed the results in the context of future water availability, vulnerability assessment, and possible adaptation strategies for the Los Angeles Region.

13. In response to Part 1 of the Framework, in 2016 the Board developed and began including ~~permit~~ language in permits and other orders to address climate change, including ~~permit~~ provisions directing dischargers~~permittees~~ to prepare a climate change vulnerability assessment and mitigation plan (Climate Change Plan) that would include an assessment of short- and long-term facility vulnerabilities as well as plans to mitigate these vulnerabilities.

14. In spring 2017, the Water Boards allocated funding for two research contracts that will help further understanding of the impacts of climate change in the Los Angeles Region. The first contract, awarded to UCLA, will use climate models to predict future precipitation, including precipitation extremes, and stream temperatures in the Los Angeles Region. The information provided will help the Los Angeles Water Board adapt its ~~permit~~ requirements in permits and other orders to future climatic conditions, and will inform Basin Plan actions to protect beneficial uses. The second contract, awarded to the Southern California Coastal Water Research Project (SCCWRP), will consider the impacts of future changes

in flow and stream temperature on the aquatic and riparian populations in the region. This will help the Los Angeles Water Board prioritize management actions based on the relative vulnerability of local species and their importance from conservation and ecosystem perspectives.

15. On August 8, 2017, the Los Angeles Water Board held a public workshop to discuss the development of the Board's climate change strategy. During the meeting, interested stakeholders were asked to consider and provide input on i) how the various impacts of climate change may affect facilities, the regulatory environment, and the region's water resources and associated beneficial uses, ii) how the Board could take these effects into consideration, and iii) how the Board could incorporate environmental justice considerations when addressing the effects of climate change.

16. Building on Part 1 and input from the public workshop, the Board is currently developing Part 2 of the Los Angeles Region Framework for Climate Change Adaptation and Mitigation - *Potential Regulatory Adaptation and Mitigation Measures*. This document will identify specific challenges caused by climate change within the activities of each of the Los Angeles Water Board's programs and offer specific actions to address those, including potential regulatory actions, monitoring and research needs, potential areas of collaboration, and environmental justice considerations.

THEREFORE, be it resolved that:

1. The Board encourages stakeholders in the region, including other agencies, to take actions to help mitigate direct and indirect impacts of climate change on water quality and beneficial uses. Actions may include:

   a) Watershed planning, including coordination between regulatory and non-regulatory efforts to focus on measures to protect against climate change impacts such as stream and wetlands protection and restoration, maintaining and increasing shading to reduce water temperature and light penetration, streambank stabilization, and protecting and establishing buffer areas around waterbodies to minimize erosion and discharge of pollutants;

   b) Managed retreat of vulnerable infrastructure instead of~~over~~ in-place adaptation measures in areas at risk of sea level rise or flooding where in-place adaptation is not feasible and/or may impair beneficial uses~~,~~; and preferential development of interim soft solutions to shoreline erosion ~~protection techniques~~ that protect, preserve, enhance, or restore beneficial uses, in lieu of shoreline protection such as riprap, seawalls, and coastal armoring due to their significant likelihood of negative impacts to beneficial uses, ecosystems, and habitat;

   c) Coordinating on the latest science and research on sea level rise effects on sea water intrusion from the perspective of coastal resilience and groundwater contamination.

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~~c)~~d) Encouraging reliance on best available science and emerging climate change and sea level rise monitoring tools such as the USGS Coastal Storm Modeling System (CoSMoS), The Nature Conservancy's Coastal Resilience tool, the Pacific Institute hazards viewer and maps, the Cal-Adapt visualization tools and data, and the NOAA Sea Level Rise Viewer.

~~d)~~e) Encouraging studies and documentation of the effects of climate change on habitat and ecological resources (e.g., trends in harmful algal blooms (HABs));

~~e)~~f) Coordinating with appropriate partners to anticipate and prevent hazards to water quality resulting from fire such as increased sediment and pollutant load, and incentivizing management measures that will ensure better resilience to fire, such as appropriate landscaping and erosion control measures.

2. In the face of expected increases in the frequency and duration of droughts, the Board supports the augmentation of local water supplies through stormwater capture, recharge, and reuse for the benefit of our communities, local wildlife and other natural resources.

3. The Board directs staff to incorporate considerations of expected impacts from climate change in its programs, including the following:

   a) The Board ~~also~~ directs staff to work with others to explore meaningful metrics and tools for conducting vulnerability assessments to ensure infrastructure protection and investigate existing strategies being used to plan for climate change adaptation. The Board also directs staff to continue refining ~~permit~~ language in permits and other orders to address climate change vulnerabilities, and to move forward towards incorporating appropriate language in National Pollution Discharge Elimination System (NPDES) permits, Clean Water Act (CWA) section 401 water quality certifications, waste discharge requirements (WDRs) and waivers of WDRs issued by the Los Angeles Water Board. ~~The Board also directs staff to work with others to explore meaningful metrics and tools for conducting vulnerability assessments to ensure infrastructure protection.~~

   b) The Board directs staff to consider supplemental environmental projects (SEPs) proposed by dischargers that address climate change adaptation and mitigation.

   c) The Board directs staff to continue the development of research and monitoring projects that will advance understanding of current and future impacts of climate change on water quality and beneficial uses, and that will identify potential management and mitigation measures.

   d) The Board also encourages staff to track trends in water quality data reported for both surface and ground water. These may include, for example, tracking groundwater monitoring data collected as part of the region's Salt and Nutrient Management Plans.

4. Given that climate change will disproportionately affect disadvantaged communities, the Board directs staff to take into account environmental justice factors when addressing climate change impacts.

5. The Board directs staff to coordinate with appropriate partners, including public agencies and nongovernmental organizations in the region, to address the impacts of climate change and to collaborate to maximize efficiency and success of the Board's actions.

6. The Board directs staff to continue collaborating with the State Water Board on actions related to climate change, including:

   a) The implementation of the *Comprehensive Response to Climate Change* resolution (~~Resolution No 2017-0012~~State Water Board Resolution No. 2017-0012).

   b) Projects and actions related to instream flow, which have a strong nexus with anticipated climate change impacts.

7. The Board directs staff to:

   a) Complete Part 2 of the Los Angeles Region Framework for Climate Change Adaptation and Mitigation - *Potential Regulatory Adaptation and Mitigation Measures* during Fiscal Year 2018-19.

   b) Use the Framework as a guide to assess specific measures to be implemented on a short-term and long-term basis by each of the Los Angeles Water Board's programs to take into account, and assist in mitigating where possible, the effects of climate change on water resources and associated beneficial uses.

   c) Report to the Board findings and recommendations arising from the Framework, and convey additional actions that the Board should consider undertaking.

8. Finally, the Board directs staff to report periodically on the progress of implementation actions and key challenges relative to climate change.

I, Deborah J. Smith, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of the resolution adopted by the California Regional Water Quality Control Board, Los Angeles Region, on May 10, 2018.

Deborah J. Smith
Executive Officer

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