STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF MAY 3, 2012
Prepared March 1, 2012

ITEM NUMBER: **14**

SUBJECT: **Adopting a Total Maximum Daily Load for Nitrate for the Los Berros Creek Subwatershed**

STAFF CONTACT: **Pete Osmolovsky 805/549-3699 or paosmolovsky@waterboards.ca.gov**

SUMMARY

In this agenda item, staff recommends the Central Coast Water Board approve the resolution (Attachment 1 to this Staff Report) that establishes a Total Maximum Daily Load (TMDL) for nitrate in the Los Berros Creek Subwatershed.

The geographic scope of this TMDL encompasses approximately 28 square miles of the Los Berros Creek Subwatershed in southern San Luis Obispo County. The Los Berros Creek Subwatershed comprises the southeastern tributary reaches of the geographically larger Arroyo Grande Creek Watershed. Please refer to Figure 1 on page 6 for a map of the TDML project area. The Los Berros Creek Subwatershed is an east-west trending drainage with headwater reaches at Temettate Ridge to the east, and ultimately draining into Arroyo Grande Creek to the west. Agriculture, including cropland and grazing lands, is the current dominant land use in the watershed. According to recent San Luis Obispo County Agriculture Commissioner crop maps, vegetable, vineyard, and orchard crops are cultivated in the subwatershed. The few urbanized areas within the subwatershed include residential areas in the lowermost reaches of the subwatershed. Upper reaches of the subwatershed are characterized by oak woodland and grasslands (source: National Land Cover Dataset, 2001, Calif. Dept. of Forestry and Fire Protection, 1977)

Los Berros Creek is listed on Central Coast Region's Clean Water Act Section 303(d) list for nitrate impairment. Consequently, designated drinking water supply (MUN) and groundwater recharge (GWR) beneficial uses are not being supported. Creek water also is not meeting non-regulatory recommended guidelines for nitrate in agricultural supply water (AGR) for sensitive crop types, indicating that potential or future designated agricultural supply beneficial uses may be detrimentally impacted[1]. The groundwater recharge (GWR) beneficial use of Los Berros Creek provides a nexus[2] between water quality in both the surface water and groundwater because the

[1] High concentrations of nitrate in irrigation water can potentially create problems for sensitive crops (e.g., grapes, avocado, citrus) by detrimentally impacting crop yield or quality. Nitrogen in the irrigation water acts the same as fertilizer nitrogen and excesses may cause problems just as fertilizer excesses cause problems. The Central Coast Basin Plan contains University of California Agricultural Extension Service guideline values for nitrate in irrigation water; these guidelines are flexible, and may not necessarily be appropriate due to local conditions or special conditions of crop, soil, and method of irrigation

[2] The Basin Plan GWR beneficial use explicitly states that the designated groundwater recharge use of surface waters is to be protected to maintain groundwater quality. As such, where necessary, the GWR beneficial uses of the surface waters need to be protected so as to support and maintain the MUN or AGR beneficial uses of the underlying groundwater resource. Indeed, protection of the GWR beneficial use of surface waters has been recognized previously in approved California TMDLs.

creek and the underlying groundwater resource are both designated for MUN and AGR beneficial uses.

The proposed TMDL, numeric targets, and load allocations for nitrate will result in meeting numeric water quality objectives for nitrate in the Los Berros Creek Subwatershed. Central Coast Water Board staff has identified sources of nitrate that are causing or contributing to water quality impairment, has identified parties responsible for these sources, and has proposed load allocations necessary to achieve the TMDLs.

Staff has identified the *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands in the Central Coast Region* (Agricultural Order) as the existing regulatory mechanism to achieve the TMDLs. No new regulatory mechanism is being proposed to implement and achieve the TMDLs.

TMDLs are often, but not universally, adopted through basin plan amendments. For this TMDL, staff recommends adoption not through a basin plan amendment, but rather through the Central Coast Water Board's approval of the resolution associated with this agenda item, which includes findings that the Agricultural Order will implement the TMDL. This TMDL approval process is referred to as a "single action" TMDL wherein the solution to an impairment can be implemented with a single vote of the Water Board. According to state policy[3], California's regional water boards are encouraged to use this type of approach for TMDL implementation when the impairments can be addressed through a single action by the Board. State policy considers this type of approach, when warranted, to be a matter of efficiency and resource allocation as it reduces regulatory and administrative redundancy.

Staff developed the technical basis for the TMDLs and associated allocations, which is provided in the Final Project Report (Attachment 2 to this staff report). The Final Project Report is provided at the Central Coast Water Board's website:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/los_berros/index.shtml

DICUSSION

Project Development for TMDLs

Staff developed the TMDL using water quality data from the Water Board's Central Coast Ambient Monitoring Program (CCAMP) and the Cooperative Monitoring Program (CMP). The CMP is managed by Central Coast Water Quality Preservation, Inc., which is the monitoring entity that works on behalf of central coast growers. Staff also used land use data, hydrologic data, soils data, and groundwater data from the U.S. Geological Survey, National Hydrography Dataset, the California Department of Conservation, the U.S. Department of Agriculture-Natural Resource Conservation Service, as well as from numerous other agency and scientific sources.

Numeric Target

Numeric targets are water quality targets developed to ascertain when and where water quality objectives are achieved, and hence, when beneficial uses are protected. The most stringent relevant water quality objective for nitrate (and therefore the one that is protective of the full range of all nitrate-impaired beneficial uses of Los Berros Creek) is the numeric Basin Plan objective for nitrate in municipal and domestic water supply. This regulatory standard is 10 milligrams per liter of nitrate as nitrogen. The numeric target for this TMDL is therefore equal to the Basin Plan numeric

[3] *Water Quality Control Policy for Addressing Impaired Waters: Regulatory Structure and Options* (State Water Resources Control Board, adopted by Resolution 2005- 0050)

water quality objective for nitrate in municipal and domestic water supply = 10 mg/L nitrate as nitrogen.

Source Analysis
Discharges of nitrate from irrigated agriculture, urban lands, grazing lands, and natural sources are contributing loads of nitrate to receiving waters. These source categories are assigned allocations for nitrate to achieve the TMDL. Irrigated agriculture is estimated to be the overwhelming majority of controllable water column nitrate loads in the TMDL project area and this source category is not currently meeting its proposed load allocation. Non-controllable, natural sources of nitrate are about 52% of the average annual total nitrate load contribution to the creek. It is important to recognize, however, that an "annual" nitrate load estimate does not adequately capture the seasonal and flow-based nature of the nitrate impairment of Los Berros Creek. During higher flows and wet-season conditions, the creek generally does not show nitrate impairment and the creek's loading capacity for nitrate during these time periods is generally is not being exceeded. However, during low flow, baseflow-dominated, and dry season conditions, the nitrate loading capacity of the creek is frequently exceeded due to discharges from controllable agricultural sources.

TMDLs and Allocations
The TMDL represents the loading capacity of a waterbody—the amount of a pollutant that the waterbody can assimilate and still support beneficial uses. The TMDL is the sum of allocations for nonpoint and point sources and any allocations for a margin of safety. Owners and operators of irrigated lands, municipal storm water entities, natural sources, and owners/operators of livestock and domestic animals are assigned nitrate load allocations equal to the TMDL and numeric target.

TMDLs are often expressed as a mass load of the pollutant but can also be expressed as a unit of concentration. The TMDL for nitrate in Los Berros Creek is a concentration-based TMDL, and is equal to the numeric target for nitrate, as described in the numeric target section above. Concentration-based TMDLs are an appropriate expression of TMDLs and meet USEPA requirements for TMDL approval. Therefore, the loading capacity for this TMDL is based on the Basin Plan nitrate water quality objective, which is an instantaneous, "do not exceed" water quality objective.

Implementation and Monitoring
Protecting California's water resources depends on the proactive engagement of citizens, land owners, researchers, and businesses. Proactive efforts by citizens that may result in improved water quality protection are commendable and should be recognized. Staff learned at a December 2011 public workshop meeting that a prominent grower in the lower Los Berros Creek area has reportedly improved irrigation efficiency by installing drip irrigation. Improved irrigation efficiency is not only potentially a good business practice, but may ultimately result in water quality improvements by reducing runoff and/or reducing nitrate impacts to groundwater. Also, local municipalities, resource organizations, non-profit environmental groups, and public agencies in the greater Arroyo Grande Creek Watershed, including tributary reaches such as Los Berros Creek, have collectively committed to cooperative watershed management through the Arroyo Grande Watershed and Creek Memorandum of Understanding.

With regard to TMDL implementation, load allocations for owners/operators of irrigated lands will be implemented and achieved by complying with the conditions and requirements of the Conditional Waiver of Waste Discharge Requirements For Discharges from Irrigated Lands (Agricultural Order) and any renewals or revisions thereof. Owners and operators are required to comply with the requirements outlined in the Agricultural Order, and subsequent revisions of the Order. Water Board staff will prioritize implementation efforts in the Los Berros Creek

subwatershed aimed at addressing discharges of nitrate as described in the TMDL Final Project Report (Attachment 2).

The goals of implementing these load allocations can be summarized as follows:

1) Control discharges of nitrate to impaired waterbodies and groundwater[4].
2) Implement management practices capable of achieving Load Allocations identified in this TMDL and demonstrate progress towards this goal during the TMDL implementation phase.

Based on available information, urban municipal separate storm sewer system (MS4) entities are in compliance with their nitrate waste load allocations for Los Berros Creek. Therefore, at this time waste load allocations are not proposed to be incorporated as enforceable effluent limitations and associated monitoring requirements into the applicable NPDES MS4 storm water permits. To protect and maintain water quality, and to continue complying with nitrate waste load allocations, these MS4 entities must continue to implement their Water Board-approved Storm Water Management Plans or approved substitute plans.

Based on available information, owners and operators of grazing operations and domestic animals on grazing lands are in compliance with their load allocation. As such, new regulatory mechanisms, reporting requirements, and formal regulatory oversight are deemed unnecessary for this source category, and are not being proposed. To maintain and protect existing water quality, owners and operators of grazing operations should begin or continue to self-monitor, self-assess and make management decisions consistent with technical guidance from existing rangeland water quality management plans, for example, the California Rangeland Water Quality Management Plan, the Central Coast Cattlemen's Grazing Lands Nonpoint Source Approach, or in conjunction with other resources appropriate to private grazing lands.

Time Schedule for Tracking Progress and Achieving the TMDLs

Water Board staff proposes a 12-year timeframe to achieve the TMDL. The timeframe for TMDL completion is based primarily on the expectation that nearly all landowners and operators of irrigated agricultural activities will have completed Farm Water Quality Plans and be implementing management practices. Water quality benefits resulting from implementing nutrient-control management measures (e.g., grass swales and riparian buffers, etc.) may take a few years to be realized. Water Board staff believes 12 years is a reasonable timeframe to implement management measures and reduce nitrate levels consistent with the allocations and the numeric target.

This time frame was also identified because:

1) Nitrate polluted shallow groundwater appears to be a major source of nitrate exceedances in Los Berros Creek.
2) Available data indicates there are not legacy pollutant loads (loads related to land use practices from many years or decades ago) present in shallow groundwater[5] that could impact creek water quality, and which would take many years or decades to dissipate or attenuate.
3) Available data indicate that baseflow mean contact time (e.g., the residence time of groundwater baseflow in the subsurface before it is expressed as stream flow) is relatively short (on the order of weeks, months, or less than one year).

[4] Shallow, recently recharged groundwater is identified in this TMDL as a substantial source contributor of nitrate loads to creek waters of the TMDL project area.

[5] Deep groundwater and deeper aquifers likely have longer residence times for nitrate; however, deep groundwater-bearing strata are unlikely to be a contributor to baseflow and nitrate loads to Los Berros creek. The nitrate loads to the creek likely originate from shallow or perched, recently-recharged groundwater sources.

4) Consequently, improved irrigation and nutrient management practices could potentially express themselves as improvements to shallow or perched groundwater quality, and surface water quality relatively rapidly.
5) The 12-year time frame is consistent with the Water Board's vision for the central coast region of healthy watersheds and clean groundwater by the year 2025.

ANTI-DEGRADATION
The proposed TMDLs are consistent with the provisions of the State Water Resources Control Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California" and 40 CFR 131.12. The TMDLs require actions that will result in improved water quality throughout the watershed and maintenance of the level of water quality necessary to protect existing and anticipated beneficial uses. The TMDL is implemented through the Agricultural Order, which is adopted in compliance with Water Code section 13269. The Order includes conditions and prohibitions requiring compliance with water quality standards, implementation of management practices to attain water quality objectives, and monitoring and reporting programs. The Order is enforceable and subject to review at least every five years.

PUBLIC INVOLVEMENT
Staff conducted stakeholder outreach efforts during TMDL development. Staff conducted public workshops in Santa Maria in December 2011 and in Nipomo in March 2012, and staff engaged with stakeholders during the development of the TMDL. Individuals and entities staff engaged with during the public workshop or during TMDL development included representatives of the following:

- Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties
- Owners or operators of agricultural operations
- Central Coast Salmon Enhancement, Inc.
- Resource Conservation Districts
- City of Arroyo Grande Storm Water Program
- County of San Luis Obispo Storm Water Program
- Individuals representing agricultural interests

The Staff Report, Resolution, and technical project reports were made available for a 30-day public comment commencing on March 1, 2012. Water Board staff solicited public comment from a wide range of stakeholders including owners/operators of agricultural operations, agricultural representatives, environmental representatives, public agencies and City and County Storm Water Program representatives.

One public comment letter was received from:

1. Ms. Janet Parrish, U.S. Environmental Protection Agency, Region IX, San Francisco.

The comment letter from the U.S. Environmental Protection Agency (USEPA) states that USEPA supports adoption of the Los Berros Creek Subwatershed Nitrate TMDL. USEPA also requested two minor, administrative clarifications in the TMDL Final Project Report which staff incorporated in the final TMDL project documents.

RECOMMENDATION
Adopt Resolution No. R3-2012-0018.

ATTACHMENTS:
The attachments are available at:

http://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/los_berros/index.shtml

1. Draft Resolution No. R3-2012-0018
2. Final Project Report: "Total Maximum Daily Load for Nitrate for the Los Berros Creek Subwatershed"
3. Notice of Public Hearing

Figure 1. TMDL Project Area – Los Berros Creek Subwatershed.