INFORMATION SHEET

TENTATIVE ADDENDUM NO. 1 TO ORDER NO. 97-49 AN ADDENDUM MODIFYING WASTE DISCHARGE REQUIREMENTS AND WATER RECYCLING REQUIREMENTS FOR THE PRODUCTION AND PURVEYANCE OF RECYCLED WATER FOR PADRE DAM MUNICIPAL WATER DISTRICT SAN DIEGO COUNTY

I. INTRODUCTION

This Information Sheet summarizes the facts and technical analyses relied upon by the California Regional Water Quality Control Board, San Diego Region (San Diego Water Board) in developing the findings, and requirements specified in Tentative Addendum No. 1 to Order No. 97-49.

II. PURPOSE AND BACKGROUND

Order No. 97-49, *Waste Discharge Requirements and Water Reclamation Requirements for the Production and Purveyance of Recycled Water for Padre Dam Municipal Water District, San Diego County*, currently establishes requirements for the discharge of up to 2.0 million gallons per day (mgd) of tertiary treated recycled water from the Padre Dam Municipal Water District Ray Stoyer Water Reclamation Facility, formerly the Padre Dam Water Reclamation Facility (hereinafter facility). Recycled water produced from the facility is currently discharged to Santee Lakes and distributed to numerous recycled water use sites, and used almost exclusively for landscape irrigation. On August 9, 2011, the Padre Dam Municipal Water District (District) submitted a Report of Waste Discharge and a Title 22 Engineering Report to the San Diego Water Board requesting use of tertiary treated recycled water produced from the facility for street sweeping and sewer flushing in the Cities of Santee, El Cajon, and the County of San Diego.

Tentative Addendum No. 1 to Order No. 97-49 (tentative Addendum) modifies Order No. 97-49 by authorizing the use of tertiary treated recycled water from the facility for street sweeping and sewer flushing. In addition, the Order also approves additional uses of disinfected tertiary recycled water allowed under California Code of Regulations, Title 22, Chapter 3, Water Recycling Criteria, after the Discharger has obtained approval for such uses from the California Department of Public Health.

According to the San Diego Watershed Workgoup, the San Diego River watershed is the second largest watershed (440 square miles) entirely within San Diego County and has the highest population (approximately 509,000). Important water resources in the watershed include five water storage reservoirs, a large groundwater aquifer, extensive riparian habitat, and coastal wetlands. Approximately 58 percent of the watershed is undeveloped, primarily in the upper reaches; the highly urbanized area is found in the lower reaches.

The lower six miles for the San Diego River watershed is listed as impaired, on the 2008 edition of the 303d List of Impaired water bodies, for: Enterococcus, low dissolved oxygen, fecal coliform, nitrogen, phosphorus, TDS, and Toxicity.

III. RATIONALE FOR REQUIREMENTS PERTAINING TO USE OF RECYCLED WATER FOR STREET SWEEPING

The tentative Addendum includes requirements that the District must comply with to ensure that the use of recycled water for street sweeping and sewer flushing, and transport of recycled water using trucks will not adversely affect public health or water quality. The requirements in the tentative Addendum are based on, or derived from the following:

a. San Diego County Water Authority Technical Information Street Sweeping Guide.

b. Letter from the California Department of Public Health to the San Diego Water Board dated May 4, 2011 which includes comments on the project.

c. Order No. R4-2002-0173, Amending Water Recycling Requirements in Order No. 01-043 for West Basin Municipal Water District (West Basin Recycling Facility).

IV. IMPACTS TO WATER QUALITY FROM USE OF RECYCLED WATER FOR STREET SWEEPING

Street sweeping vehicles are typically equipped with dust suppression systems which spray small amounts of water on the ground to prevent generation of dust during sweeping. Most of the applied recycled water will be vacuumed up by the street sweeping vehicle's vacuum system, while the remaining residual will evaporate from the ground. It is estimated that the street sweeping vehicle can use up to 660 gallons per day (gpd) of recycled water. The sweeping vehicle tank holds 220 gallons of water, and each sweeping vehicle fills on average about 3 times a day. One street sweeping truck will be used within the City of Santee four days a week on the first, second, third, and fourth week of the month. The District's billing records show that an average of 52,000 gallons per year (gpy) of potable water has been used by the City of Santee each year for street sweeping from 2008-2012, so it is expected that a similar amount of recycled water will be used for street sweeping in place of potable water.

Recycled water used for street sweeping will be applied on hard or impermeable street surfaces so it is expected there will be limited impact to groundwater quality, since there will be limited infiltration to groundwater. The main constituents of concern in recycled water discharges that could have potential adverse impacts to surface waters and groundwater are Total Dissolved Solids (TDS) and nitrate. Storm water runoff can transport TDS and nitrate contained in recycled water applied to street surfaces to the storm drain system and surface waters. As a result, TDS and nitrate loading from use of recycled water for street sweeping have been estimated in this analysis. The following values were used in determining TDS and nitrate loading from recycled water:

Table 1: Recycled and Potable Water Quality

Paramater	Recycled Water TDS (milligrams per liter, mg/L) [1]	Recycled Water Nitrate (mg/L) [1]	Potable Water TDS (mg/L)[2]	Potable Water Nitrate (mg/L)[2]
Average	817	3.40	358	0.25
Maximum	990	5.66	425	0.30
Minimum	562	0.93	270	0.20

[1] Recycled water TDS and nitrate concentrations from monthly monitoring reports for the Padre Dam Municipal Water District, Ray Stoyer Water Reclamation Facility from 2009-2011

[2] Potable water TDS and nitrate concentrations from Padre Dam's Municipal Water District 2011 Annual Water Quality Report

Table 2: TDS and Nitrogen Loading from Use of Recycled Water for Street Sweeping

Mass Loading from Use of Recycled Water for Street Sweeping[3, 4]				
Parameter	**TDS loading in pounds/year (lbs/yr) using 137,280 gpy**	**TDS loading in lbs/yr using 52,000 gpy**	**Nitrate loading in lbs/yr using 137,280 gpy**	**Nitrate loading in lbs/yr using 52,000 gpy**
Average	934	354	3.89	1.47
Maximum	1,132	429	6.47	2.45
Minimum	642	243	1.06	0.40
Mass Loading from Use of Potable Water for Street Sweeping[3, 4]				
Parameter	**TDS loading in lbs/yr using 137,280 gpy**	**TDS loading in lbs/yr using 52,000 gpy**	**Nitrate loading in lbs/yr using 137,280 gpy**	**Nitrate loading in lbs/yr using 52,000 gpy**
Average	409	155	0.29	0.11
Maximum	486	184	0.34	0.13
Minimum	309	117	0.23	0.09

[3]Projected maximum volume of recycled water used for street sweeping is 660 gpd or 137,280 gpy, while the average volume of water used for street sweeping from 2008-2012 is about 52,000 gpy (based on Padre Dam Municipal Water District's billing meter records for the City of Santee)

[4]Loading in lbs/yr = concentration in mg/L x flow in gpy x 3.785 liters/gallon x 100,000 kilograms (kg)/milligram (mg) x 2.2 lbs/kg.

The calculations below estimate the TDS and nitrate loadings to surface waters from dry weather discharges into the municipal storm drain system located within the City of Santee.

Table 3: Dry Weather Runoff Flow Estimates and Water Quality Values

Parameter	Flow (gallons per minute, gpm)	Flow (gpy)	Conductivity (millisiemens per centimeter, mS/cm)	TDS(mg/L)[5]	Nitrate (mg/L)
Average	4.7	1,440,144	2.74	1,836	5.36
Maximum	28	14,176,800	5.07	3,397	23.6
Median	1	1,355,024	2.54	1,702	4.17
Standard Deviation	7.1	683,280	1.3	871	5.51

[5]Data from the City of Santee 2009/2010 Jurisdictional Urban Runoff Management Program Annual Report.

Table 4: TDS and Nitrate Mass Loading from Dry Weather Runoff[6]

Parameter	TDS (lbs/yr)	Nitrate (lbs/yr)
Average	22,015	64.3
Maximum	416,279	2,892
Median	18,918	46.4
Standard Deviation	4,956	31.4

[6]Loading in lbs/yr = concentration in mg/L x flow in gpy x 3.785 liters/gallon x 100,000 kilograms (kg)/milligram (mg) x 2.2 lbs/kg

V. SUMMARY OF TDS AND NITRATE IMPACTS

Residual loads of TDS and nitrate left on street surfaces after sweeping will increase when potable water is replaced with recycled water in street sweepers. If all of the dissolved solids and nitrate in the recycled water are left as residual salts on the roadways, the average annual increase in residual nitrate ranges from 1.36 to 3.6 pounds per year. The average annual increase in residual TDS ranges from 199 to 525 pounds per year.

How these loads will affect TDS and nitrate concentrations in storm water runoff is unknown, and depends on the frequency, intensity, and duration of intervals between storms in the Santee area. Because the volume of runoff generated by storms is high compared to the volume of recycled water applied to roadways, the residual salts on the roadways will most likely not cause storm water to exceed TDS and nitrate water quality objectives. Concentrations of TDS and nitrate would be higher during storm events that produce lower levels of rain. For example, a precipitation event that produced 0.000041 inches of rain (which is unlikely to produce any runoff) falling on the 34 miles of roadway with 934 pounds of residual TDS and 3.89 pounds of residual nitrate, from sweeping streets with recycled water, may produce storm water on the roadway with a TDS concentration of 1,002 mg/L and a nitrate concentration of 6.33 mg/L. Average annual rainfall in the Santee area is 11.96 inches per year. Using the same TDS and nitrate loading assumptions, as described above, the predicted storm water runoff would have a TDS concentration of 0.0034 mg/L, and a nitrate concentration of 1.43×10^{-5} mg/L. Thus, street sweeping with recycled water is not likely to contribute to the TDS and nitrate impairments of the San Diego River.

Dry weather flows contain significantly higher TDS and nitrate concentrations than recycled water and are the likely cause of impairment to the San Diego River. Dry weather flows are discharged to the river system principally through the municipal separate storm water system. The solution to the TDS and nitrate impairments is to eliminate dry weather flows to the San Diego River system.

VI. SALT AND NUTRIENT MANAGEMENT PLAN

The tentative Addendum requires the District to submit a workplan within 180 days of adoption of the addendum identifying proposed tasks, measures, and a schedule it will implement for the development of a salt and nutrient management plan for the Santee/El Monte basin. The salt and nutrient management plan for the Santee/El Monte basin must be completed by May 14, 2014.

The Recycled Water Policy requires local water and wastewater entities and local salt/nutrient contributing stakeholders to develop regional or sub-regional salt and nutrient management plans for all groundwater basins within the State. The District is the largest wastewater agency and purveyor of recycled water within the Santee/El Monte basin. As a result, the San Diego Water Board has identified the District as the lead agency responsible for developing a salt and nutrient management plan for the basin. The proposed tasks and measures to be included in the Salt and Nutrient Management Plan must be based on the *Guidelines for Salinity/Nutrient Management Planning in the San Diego Region* (salt and nutrient management plan guidelines) which were endorsed by the San Diego Water Board on November 10, 2010.

VII. REFRENCES

1. California Department of Public Health. May 4, 2011. *Letter from California Department of Public Health to the San Diego Water Board.*

2. California Regional Water Quality Control Board, Los Angeles Region. October 22, 2002. *Order No. R4-2002-0173 Amending Water Recycling Requirements in Order No. 01-043 for West Basin Municipal Water District (West Basin Water Recycling Facility).*

3. City of Santee. December 2010. *2009/2010 Jurisdictional Urban Runoff Management Program Annual Report.*

4. Padre Dam Municipal Water District. *2011 Annual Water Quality Report.*

5. Padre Dam Municipal Water District. September, 11, 2012*. City of Santee Water Consumption History.*

6. Padre Dam Municipal Water District. Summary of Padre Dam Municipal Water District, Ray Stoyer Water Reclamation Facility Effluent Quality Data (from 2009-2011).

7. San Diego County Water Authority. *Technical Information Street Sweeping Guide.*