Exhibit N

Technical Memorandum

HydroScience Engineers, Inc.

To: John Tinger, USEPA
From: Curtis Lam
Subject: Response to Comment 9-4: Water Balance
Date: December 22, 2006 **(updated April 24, 2007)**
CC: Tom Keegan, Erich Fischer, Michelle Hickey

Purpose

The purpose of this memorandum is to provide the Tribe's response to Comment No. 9-4 for the Dry Creek Rancheria Band of Pomo Indians' proposed NPDES Permit No. CA0005241.

Comment

9-4: A complete "water balance" analysis has not been provided. There is a "pressing need for some evidence that the Tribe's proposed disposal and storage scheme is actually feasible as a matter of fact. Neither the proposed statement of basis nor the proposed permit includes a water balance or other information demonstrating that the Tribe's surface discharges, storage areas, and spray fields could actually accommodate the proposed 300 percent increase in treated wastewater." It is not at all clear whether the proposed effluent disposal/storage scheme is feasible to surface waters, the limited land area for effluent disposal and the uncertainties described in the proposed permit.

Response to Comment

The Tribe has prepared this water balance in response to Comment No. 9-4. This water balance is presented in the attached **Table 1**, and described below. This water balance was updated to reflect the removal of Stream A1 as a surface water discharge.

This water balance provided an effluent disposal strategy for two different flow situations. One flow rate assumed disposal at the current average flow rate of 28,000 gpd, the other at a projected flow rate of 120,000 gpd. The higher flow rate was selected based on it being a relatively high average daily flow rate. Since the facilities required to store, treat, and discharge 120,000 gpd are greater than the 2004 average daily flow rate of 28,000 gpd, those facilities are described below.

If 120,000 gpd of wastewater is generated every day, approximately 134 acre-feet per year (AFY) of effluent is produced. This effluent would be discharged as follows:

Toilets/urinals: Approximately 15,000 gpd of recycled water would be used for toilet and urinal flushing year round, which is equivalent to 16.8 AFY (12.5% of total volume). Available recycled water is first used for toilet and urinal flushing on-site prior to all other uses.

Irrigation: Irrigation of up to 12 acres of tribal lands (including spray fields, landscaped areas, etc.) would be at agronomic rates. Agronomic rates are based on climatological data as defined by the local California Irrigation Management Information Service weather station. A discussion of how this data translates to a monthly unit irrigation demand is contained below.

Based on local climate data and agronomic rates, irrigation water is typically only required between March and October. During other months, the average precipitation rate is higher than the evapotranspiration (ET) rates. Thus, plants do not have a demand for excess water during these times.

Based on an annual ET rate for CIMIS Station #103, the total annual volume of water used for irrigation of Tribal lands is equal to 50.2 AFY (37.3% of the total volume). All remaining recycled water (following the usage for toilets/urinals) is used for irrigation of Tribal lands when irrigation water is needed.

Stream P1: Discharge to Stream P1 would only occur after the toilet/urinal and on-site irrigation demands are satisfied. Additionally, discharge to Stream P1 is limited to the time period between October 1 and May 14, and flow limited as specified in the permit. Since wintertime irrigation demands are relatively low, effluent generated during these times is either reused on-site for toilet/urinal flushing, or discharged to Stream P1. The total volume discharged to Stream P1 is 67.48 AFY (50.2% of total volume). Additionally, during the end of the summer, when irrigation demands decrease due to lower ET rates, and discharge to Stream P1 is not allowed, some effluent would be seasonally stored on-site. Based on these calculations, up to 3.14 AF will need to be stored during August and September. This stored volume of water would be detained in on-site recycled water storage tanks or ponds until discharge to Stream P1 is allowed. During the allowable discharge period, Stream P1 flows would be slightly higher than the daily effluent flows, as the on-site storage facilities are drained. However, flows to Stream P1 would still remain within the flow limitations identified in the NPDES permit.

Irrigation Demands

To supplement this comment response, the following section contains information about how the monthly irrigation demands were calculated.

Irrigation demands were calculated based on the historical average CIMIS data for Station #103 in Windsor, CA. This station was selected based on its close proximity to the Rancheria, and its active status. The monthly average evapotranspiration and precipitation data was downloaded from the CIMIS website, which is located at http://www.cimis.water.ca.gov/.

To calculate a monthly average unit irrigation demand, the following assumptions were utilized.

ET Rates: ET is a measure of water usage by a particular plant or crop, and is a function of the net solar radiation, air temperature, wind speed, and vapor pressure in a particular location. Evapotranspiration rates for a specific crop in a specific location are calculated on a monthly basis by the following equation:

$$ET = ET_o * k_c$$

where:

ET_0 = Normal year reference crop evapotranspiration rate for CIMIS Station #103 in Windsor

k_c = Crop coefficient for a given crop (University of California Cooperative Extension Leaflet, 1997), which is equal to 0.8

Precipitation: During the months from November through March, an additional six inches (30 inches total) for each month was added to the CIMIS Station #103 data to account for rainfall from a 100-year storm. The average annual precipitation rate was 32.79 inches per year. With the 100-year storm season, the precipitation rate used in this calculation was 62.79 inches per year.

Estimated Unit Irrigation Demands: Typical monthly unit irrigation demands for turf grasses are summarized in and were calculated using the following formula:

$$ID = \frac{(ET - Pe_p)l_r}{e_i}$$

where:

ID = Irrigation demand or allowable irrigation in inches

ET = Evapotranspiration for turf grasses in the Windsor area

P = Average precipitation (CIMIS + 100-year storm season)

e_p = Precipitation irrigation efficiency, 0.75. Assumes 25% of rainfall during growing season is lost to evaporation, runoff, etc.

l_r = Loss Rate or Leachate Factor, equal to 1.2. This assumes that approximately 10% of the applied water passes through the grass root zone and is lost.

e_i = Irrigation efficiency, equal to 0.8. This assumes that 20% of the applied irrigation water is lost to evaporation.

The net monthly unit irrigation demand calculated based on this data is shown in **Table 2**. These irrigation demands were used to size the required on-site irrigation areas on the Rancheria.

Table 2: Summary of Monthly Unit Irrigation Demands

Month	Precipitation with 100-year (in)	Irrigation Demand (in)
January	10.22	0.00
February	10.48	0.00
March	12.36	0.12
April	12.94	4.35
May	9.27	8.17
June	2.53	10.24
July	1.10	11.43
August	0.85	9.96
September	0.92	6.56
October	1.01	2.69
November	0.31	0.00
December	0.81	0.00
Total	**62.79**	**53.52**

Table 1: Water Balance
Dry Creek Rancheria Band of Pomo Indians Response to Comment 9-4 for NPDES Permit No. CA 0005241

Water Balance for 28,000 gpd average daily flows (2004 average daily flow)

2004 Average Daily Flow 28000 gpd

			Volume Discharged (Acre-feet)			
Month	Days	Irr Demand (in)	Effluent Volume	Toilets/Urinals	On-site Irrigation Usage	Stream P1
January	31	0.00	2.66	0.71	1.95	0.00
February	28	0.00	2.41	0.64	1.76	0.00
March	31	0.12	2.66	0.71	1.95	0.00
April	30	4.35	2.58	0.69	1.89	0.00
May	31	8.17	2.66	0.71	1.95	0.00
June	30	10.24	2.58	0.69	1.89	0.00
July	31	11.43	2.66	0.71	1.95	0.00
August	31	9.96	2.66	0.71	1.95	0.00
September	30	6.56	2.58	0.69	1.89	0.00
October	31	2.69	2.66	0.71	1.95	0.00
November	30	0.00	2.58	0.69	1.89	0.00
December	31	0.00	2.66	0.71	1.95	0.00
Total (AF)			**31.37**	**8.40**	**22.96**	**0.00**
Total (MG)			**10.22**	**2.74**	**7.48**	**0.00**

Water Balance for 120,000 gpd average daily flows

Potential Average Daily Flow 120000 gpd

			Volume Discharged (Acre-feet)					
Month	Days	Irr Demand (in)	Effluent Volume	Toilets/Urinals	On-site Irrigation Demand	Stream P1	To/From Storage	Net Volume in Storage
January	31	0.00	11.42	1.43	0.00	9.99	0.00	0.00
February	28	0.00	10.31	1.29	0.00	9.02	0.00	0.00
March	31	0.12	11.42	1.43	0.12	9.87	0.00	0.00
April	30	4.35	11.05	1.38	4.35	5.32	0.00	0.00
May	31	8.17	11.42	1.43	6.81	3.18	0.00	0.00
June	30	10.24	11.05	1.38	9.67	0.00	0.00	0.00
July	31	11.43	11.42	1.43	9.99	0.00	0.00	0.00
August	31	9.96	11.42	1.43	9.96	0.00	0.03	0.03
September	30	6.56	11.05	1.38	6.56	0.00	3.11	3.14
October	31	2.69	11.42	1.43	2.69	10.44	-3.14	0.00
November	30	0.00	11.05	1.38	0.00	9.67	0.00	0.00
December	31	0.00	11.42	1.43	0.00	9.99	0.00	0.00
Total (AF)			**134.43**	**16.80**	**50.15**	**67.48**		
Total (MG)			**43.80**	**5.48**	**16.34**	**21.99**		

Notes:
Water balance assumes maximizing on-site (toilets/urinals and irrigation) usage before discharge to a surface water.
Toilets/urinals fixed at an estimated 7,500 gpd year round for 2004 water balance, and 15,000 gpd for potential water balance.
Irrigation demand based on CIMIS station #103, located in Windsor Adjustment factors for the average rainfall, 100-year storm season adjustment, irrigation efficiency, turfgrass K value, and leachate value were used to determine an irrigation demand per month.
Landscape irrigation available to the Tribe during 2004 was five acres. It was noted that 2004 irrigation application rates are higher than the agronomic demand.
For the 120,000 gpd water balance, irrigation demands are based on irrigated at local evapotranspritation rates and having up to twelve acres available for irrigat
Stream P1 discharges are zero between May 15 and September 30. May discharges to Stream P1 are assumed to only occur between May 1 and May 14.
AF = Acre-feet, MG = Million Gallons
Tribe had approximately 1.2 MG (3.8 AF) of seasonal recycled water storage in 2005.