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April 23, 2009

CPNPP HYDRO Package

NRC Needs List: AE-19

Subject: Attachment 1 Spreadsheet

Signature Date

April 23, 2009

Category		Total Alkalinity	Total Arsenic	Total Barium	Bicarbonate Alkalinity	Total Boron	Total Cadmium	Total Calcium	Carbonate Alkalinity	Chloride	Chlorophyll a	Total Chromium	Fecal Coliform	Total Coliform	Total Copper	Hardness, $CaCO_3$	Total Iron	Total Lead	Total Magnesium	Total Manganese	Dissolved Mercury	Total Mercury	Total Nickel	Nitrate as N	Nitrite	Orthophosphate	Total Phosphorous	Total Potassium	Total Selenium	Silica
		COMPOUNDS MEASURED IN LAKE GRANBURY																													
		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/m³	mg/L	col/100mL	col/100mL	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
(1) Criteria for Specific Metals in Water for Protection of Aquatic Life			0.19				0.0021					0.373			0.027			0.008				0.0013	0.338						0.005	
Human Health Criteria in Water			0.05	2			0.005					0.1						0.00498				0.0000122		10					0.05	
Screening Levels for Nutrient Parameters											0.0267													0.37			0.2				
(1) TSWQS for Lake Granbury										1000																					
CPNPP TPDES													400		1		1														
Values calculated from quarterly monitoring at stations in Lake Granbury	Mean Concentration	132	0.003	0.112	120	1.925	0.0005	71.7	5	296	40.542	0.003	152	6851	0.009	245	0.47	0.003	15.6	0.038	0.0001	0.0001	0.003	0.08	0.2	0.24	0.186	6.30	0.003	13.8
	Max Concentration	141	0.003	0.164	164	2.500	0.0005	99.7	5	594	260.000	0.003	1100	25000	0.018	347	2.16	0.003	23.7	0.163	0.0001	0.0001	0.003	0.19	0.5	4.40	2.460	7.30	0.003	18.3
(2) Concentration of chemicals added to the system and factored into the effluent	Low	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	High	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2.4 -Cycle Concentration (3)	Mean concentration	317	0.006	0.268	289	4.619	0.0012	172.2	12	711	97.300	0.006	364	16442	0.022	588	1.12	0.006	37.4	0.091	0.0002	0.0002	0.006	0.20	0.4	0.58	0.447	15.13	0.006	33.1
	Max concentration	338	0.006	0.394	394	6.000	0.0012	239.3	12	1426	624.000	0.006	2640	60000	0.043	833	5.18	0.006	56.9	0.391	0.0002	0.0002	0.006	0.44	1.2	10.56	5.904	17.52	0.006	43.9
Diluted Effluent at Low Flow	Mean concentration	346	0.007	0.293	315	5.043	0.0013	188.0	13	776	106.218	0.007	398	17949	0.024	642	1.22	0.007	40.9	0.099	0.0003	0.0003	0.007	0.22	0.4	0.63	0.488	16.51	0.007	36.1
	Max concentration	369	0.007	0.430	430	6.550	0.0013	261.2	13	1556	681.193	0.007	2882	65499	0.047	909	5.66	0.007	62.1	0.427	0.0003	0.0003	0.007	0.48	1.3	11.53	6.445	19.13	0.007	47.9
Diluted Effluent at Annual Mean Flow	Mean concentration	149	0.003	0.126	136	2.171	0.0006	80.9	6	334	45.737	0.003	171	7729	0.010	277	0.53	0.003	17.6	0.043	0.0001	0.0001	0.003	0.09	0.2	0.27	0.210	7.11	0.003	15.6
	Max concentration	159	0.003	0.185	185	2.820	0.0006	112.5	6	670	293.316	0.003	1241	28203	0.020	391	2.44	0.003	26.7	0.184	0.0001	0.0001	0.003	0.21	0.6	4.96	2.775	8.24	0.003	20.6

cfs = cubic foot per second
L/sec = liters per second
CPNPP - Comanche Peak Nuclear Power Plant
TPDES - Texas Pollution Discharge Elimination Standard
TSWQS - Texas Surface Water Quality Standard

MEAN and MAX Concentrations - Calculated based on quarterly monitoring data from Lake Granbury. For values reported as nondetects, 1/2 of the analytical reporting limit or 1/2 the screening level, whichever was smaller, was used in calculating the mean and max concentration for each analyte, based on Draft 2008 Guidance for Assessing and Reporting Surface Water Quality in Texas (December 21, 2007) (pg 37).

Additive - chemicals that will be added to system(s) and will not undergo cycle concentration. Additives with chemical concentrations estimated to be below the detection limit were reported at the detection limit. Additives that are added intermittently are not included in the dilution calculation.

"--" - Not evaluated for that compound

Notes:
(1) Screening Levels Used as the Primary Screening Level.
(2) Concentration of additives are not increased by the number of cycles.
(3) The Mean or Max analyte concentration is increased by the number of cycles
** Amount to be determined by TPDES permit

Equation for Diluted Effluent Concentrations

$$EC = \frac{\text{Cycle Mean/Max Concentration} * PDR}{PDR + FR} + \text{Mean/Max Concentration}$$

This is not intended to be a scientific model after discharge into Lake Granbury and does not account for fate and transport processes.

HIGHLIGHTED ANALYTES REPRESENT AN EXCEEDENCE OF THE CORRESPONDING REGULATORY LEVEL

For Screening Level:
The default screening level used was the Aquatic Life Criteria or TSWQS Criteria. If neither was provided, then the screening level for Nutrient Parameters was used. If the Nutrient Parameters criteria was not provided then the Human Health Criteria was used or the TPDES criteria.

 # Cycle Concentration 2.4
1 cfs = 448.8312 gpm
1 cfs = 28.31685 L/sec

Low Flow	gpm	cfs	L/sec
Plant Discharge Rate (PDR) =	26100	58.15	1646.65
Flow Rate (FR) =		28	792.87

Annual Mean Flow	gpm	cfs	L/sec
Plant Discharge Rate (PDR) =	26100	58.15	1646.65
Flow Rate (FR) =		1031	29194.67

Editable Cell

TXUT-001-ER-5.2-CALC-007
ATTACHMENT 1
Page 1 of 2

Category		Total Silver	Total Sodium	Fecal Streptococci	Sulfate	Total Dissolved Solids	Total Kjeldahl Nitrogen	Turbidity	Total Zinc	COMPOUNDS ADDED TO THE SYSTEM: Sodium Hypochlorite	pH/LSI adjustment Sulfuric Acid	Corrosion Inhibitor Proprietary Orthophosphate & Phosphonate	OTHER POTENTIAL DISCHARGE COMPOUNDS (see note below): Biochemical Oxygen Demand	Chemical Oxygen Demand	Total Suspended Solids	Ammonia Nitrogen	pH	Temperature
		mg/L	mg/L	col/100mL	mg/L	mg/L	mg/L	NTU	mg/L	ppm	ppm	ppm	mg/L	mg/L	mg/L	mg/L		deg C
(1) Criteria for Specific Metals in Water for Protection of Aquatic Life									0.225									
Human Health Criteria in Water																		
Screening Levels for Nutrient Parameters																0.11		
(1) TSWQS for Lake Granbury					600	2500											6.5-9.0	
CPNPP TPDES						4000							45		45			
Values calculated from quarterly monitoring at stations in Lake Granbury	Mean Concentration	0.001	195	7	121.6	1012	0.490	42.3	0.012				2.7	24.0	54.7	0.149	8.03	63.71
	Max Concentration	0.001	369	80	232.0	7010	0.920	350.0	0.024				7.7	65.0	672.0	0.520	8.44	83.78
(2) Concentration of chemicals added to the system and factored into the effluent	Low	--	--	--	--	--	--	--	--	0.2	2.2	**						
	High	--	--	--	--	--	--	--	--	0.2	2.2	**						
2.4 -Cycle Concentration (3)	Mean concentration	0.001	467	18	291.8	2429	1.177	101.6	0.029				--	--	--	--	--	--
	Max concentration	0.001	883	192	556.8	16824	2.208	840.0	0.058				--	--	--	--	--	--
Diluted Effluent at Low Flow	Mean concentration	0.001	510	20	318.6	2652	1.285	110.9	0.032	0.135	1.48498	**	--	--	--	--	--	--
	Max concentration	0.001	964	210	607.8	18366	2.410	917.0	0.063	0.135	1.48498	**	--	--	--	--	--	--
Diluted Effluent at Annual Mean Flow	Mean concentration	0.001	220	8	137.2	1142	0.553	47.8	0.014	0.01068	0.11746	**	--	--	--	--	--	--
	Max concentration	0.001	415	90	261.7	7908	1.038	394.8	0.027	0.01068	0.11746	**	--	--	--	--	--	--

These chemicals are not considered to increase by the number of cycles and will be affected by the chemicals added to the system.

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