

February 19, 2016

Lauren Fondahl, Biosolids Coordinator
Clean Water Act Compliance Office
U.S. EPA Region 9 (WTR-7)
75 Hawthorne Street
San Francisco, CA 94105-3901

Dear Ms. Fondahl:

RE: 2015 Biosolids Annual Report for 40 CFR 503

Attached is the signed, original Certification Statement for Pathogen and Vector Attraction Reduction for the Annual Report required in 40 CFR 503 Regulations on the Use or Disposal of Sewage Sludge from East Bay Municipal Utility District's Main Wastewater Treatment Plant for the period of January 1, 2015 to December 31, 2015. The rest of the report was prepared using the Excel spreadsheet on the Region 9 website and was submitted by e-mail on February 19, 2016.

All values of the District's sludge operations were in full compliance with the requirements of metal pollutants, pathogen reduction and vector attraction reduction.

If you have any questions, please contact me at (510) 287-0509.

Sincerely,



Chris Dembiczak
Senior Environmental Health & Safety Specialist

Attachment

CD:cd

General Facility Information

Annual 40 CFR 503 Report submitted to EPA Region 9

Calendar Year 2015

Facility: EBMUD SD-1

Permits, Locations and Contacts

Permit No. (NPDES permit if applicable)	CA0037702
Facility Name	East Bay Municipal Utility District Special District No. 1
Authority Name	State Water Resources Control Board
Regional Board Number (California only)	2

Facility Physical Address

Street	2020 Wake Ave.
City	Oakland
County	Alameda
State or Tribal Nation	CA
Zip Code	94607
Phone	(510) 287-1456

Facility Mailing Address

Street	P.O. Box 24050, M/S 59
City	Oakland
State	CA
Zip Code	94623-1055

Responsible Official

Name	David Freitas
Title	Wastewater Treatment Superintendent

Biosolids Contact Person

Name	Alicia Chakrabarti
Title	Senior Civil Engineer
E-mail	achakrab@ebmud.com
Phone	(510) 287-2059
Fax	(510) 287-1530

Facility Type, Production

Type of facility: (enter code(s) listed below pertaining to your facility on this line)	POTW
Publicly owned treatment works: Compost operation: State Facility: Privately owned treatment works: Compost operation: Alkali treatment operation: Heat drying operation: Land application operation: Other (fill in):	POTW Comp SOTW PROTW Comp Alk Htdry Land
Annual biosolids production, in dry metric tons per year (DMTY), 100% dry weight basis	16,046
Average Daily Influent Flow to plant, millions of gallons per day (MGD) (if this is a wastewater treatment plant)	50
Does this facility have a design capacity equal to or greater than 1 million gallons per day (MGD)? (Y/N)	Y
Is Pretreatment Required? (Y/N)	Y
Is this a "sludge-only" facility (no treatment of wastewater)? (Y/N)	N
Does the facility send biosolids out of county? (Y/N). If Yes, list counties to which sent and volume (DMTY) sent.	Y
Volume, DMTY sent to other county, County 1 Name of county Name of state or tribal nation	6,947 Merced
Volume, DMTY sent to other county, County 2 Name of county Name of state or tribal nation	5,035 Solano
Volume, DMTY sent to other county, County 3 Name of county Name of state or tribal nation	3,514 Contra Costa
Volume, DMTY sent to other county, County 4 Name of county Name of state or tribal nation	551 Santa Clara

Description of processes

Give a brief description of your sewage sludge treatment and use/disposal practices:

Primary sludge, thickened waste activated sludge, truck delivered organic wastes (renderings, food wastes and concentrated fats, oils, and greases (FOG)) are blended together and treated in anaerobic digesters operating at the low end of the thermophilic range. The digestion system is operated in series with approximately six mechanically-mixed first stage digesters running at ~51°C transferring their product sludge to three passively mixed second stage digesters which operate at ~44 °C. Digester Gas produced by the breakdown of organic material is burned to either produce electricity or heat and any excess gas is flared.

Second stage digesters transfer their final product sludge to dewatering centrifuges for production of biosolids cake of sufficient solids content for hauling. The resultant cake product is used as Alternative Daily Cover on a year round basis, while during dry weather the majority of biosolids cake produced is land applied as fertilizer for non-food crops.

Describe any changes to your operations, any unique features or operational issues encountered during past year:

N/A

Describe any instances of non-compliance and measures taken to correct it.

N/A

BIOSOLIDS TREATMENT PROVIDED

For each treatment type, please indicate which method(s) your facility uses to treat its solids.

For example, if three anaerobic digesters are used, enter the code for anaerobic digesters followed by the number three in parentheses: The number entered will look like 6(3).

If more than one method is used for each process, please separate the codes with commas.

For example, if 3 digesters, 2 centrifuges, and 10 drying beds are being used, enter 6(3), 18(10), 21(2).

THICKENING	Type thickening code(s) into the box below: 1(3)
Codes to use for thickening:	
1. Gravity	
2. Dissolved-Air Flotation (DAF)	
3. Centrifuge (enter number of centrifuges in use)	
4. Other (briefly describe to right)	

STABILIZATION/PATHOGEN REDUCTION	Type stabilization code(s) into the box below: 7(9)
Codes to use for stabilization:	
5. Aerobic Digestion	
6. Thermophilic aerobic digestion	
7. Anaerobic Digestion	
8. Thermophilic anaerobic digestion	
9. Pasteurization	
10. Chemical (Alkali) Stabilization	
11. Composting	
12. Other (briefly describe ito right)	

CONDITIONING	Type conditioning code(s) into the box below: 13(2), 14(1)
Codes to use for conditioning:	
13. Chemical Conditioning (list tpe of polymer)	Emulsion Polymer, Mannich Polymer
14. Other (briefly describe)	Ferric Chloride for H2S control

DEWATERING	Type dewatering code(s) into the box below: 21(5)
Codes to use for dewatering:	
15. Vacuum Filter	
16. Pressure Filter	
17. Belt Filter	
18. Drying Beds	
19. Drying Lagoon	
20. Heat Drying Units	
21. Centrifuge	
22. Other (briefly describe to right)	

OTHER	Type other applicable code(s) into the box below:
Codes to use for "other":	
23. Wastewater Lagoon	
24. Oxidation Ditch	
25. Incineration	
26. Fuel (briefly describe to right)	
27. Septage	
28. Other (briefly describe to right)	

Digester Performance

If the facility used digestion to demonstrate pathogen reduction during the reporting year, please fill in this table.

Annual 40 CFR 503 Report submitted to EPA Region 9

Calendar Year 2015

Facility: EBMUD SD-1

Reporting Period: 01/01/2015 - 12/31/2015
Number of Digesters Inservice: 8.5

		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th	14th	15th	16th	17th	18th	19th	20th	21st	22nd	23rd	24th	25th	26th	27th	28th	29th	30th	31st	AVERAGE
January	Time	27	27	27	28	28	27	26	26	26	27	26	27	27	26	24	24	24	24	24	24	24	23	23	23	23	24	24	24	24	25	25	25
	Temp	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	45	46	46	46	46	
	VSR	68	69	69	69	68	70	70	71	72	71	71	71	71	71	71	71	72	72	72	73	73	73	74	74	74	74	73	73	74	74	73	72
February	Time	25	25	26	26	26	26	26	26	26	25	25	25	25	25	25	26	25	24	24	24	24	24	25	24	24	25	25	24				25
	Temp	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	45	45	45	45	45	45	45	45	46				46
	VSR	73	72	72	72	71	70	69	69	68	67	66	65	64	63	63	63	63	62	62	61	60	60	60	60	61	62	64	63				65
March	Time	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	24	24	24	24	24	24	24	25	25	24	24	24	24	24	24	24	24
	Temp	46	46	46	46	46	46	47	47	47	47	47	47	47	47	47	47	47	47	46	46	46	46	46	46	46	46	46	46	46	46	46	46
	VSR	63	63	63	63	64	65	66	66	66	66	68	68	68	68	68	68	67	68	69	71	71	70	70	70	69	70	69	68	67	67	68	67
April	Time	24	24	23	23	23	24	24	24	24	25	25	25	26	26	26	26	26	26	26	26	25	25	24	24	24	24	24	24	24	25		25
	Temp	46	46	46	46	46	46	46	46	46	46	46	46	46	46	45	45	45	45	45	45	45	45	45	45	45	45	45	44	44	44	44	45
	VSR	67	67	66	66	66	66	65	66	66	66	65	66	66	67	68	68	67	67	67	67	67	67	67	68	68	69	69	68	67	67	66	67
May	Time	24	24	24	25	25	25	25	25	25	25	25	25	24	24	24	24	24	24	23	23	22	22	22	22	22	22	22	23	22	22	24	
	Temp	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44
	VSR	66	66	66	66	65	64	64	64	64	64	65	65	66	66	66	66	66	66	66	66	67	67	66	66	65	64	64	64	64	63	63	65
June	Time	23	23	23	23	23	22	22	23	24	24	24	24	24	23	23	24	24	24	24	24	24	25	24	23	24	23	23	23	23	23		23
	Temp	44	44	44	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	43	42	42	42	42	42	42	42	43
	VSR	64	65	66	65	65	65	65	65	66	66	66	65	65	65	65	64	64	63	63	63	63	63	64	64	64	63	63	63	64	65		64
July	Time	22	22	22	22	23	23	23	22	21	21	22	22	22	22	21	21	22	21	21	22	21	21	21	21	21	21	21	22	22	22	22	22
	Temp	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	43	43	43	43	43	43	42	42	42	42	42	42	42	41	41	41	42
	VSR	65	65	66	66	66	65	65	65	65	66	67	67	67	66	66	66	65	64	64	64	64	65	64	63	62	62	62	62	62	63	63	65
August	Time	21	21	22	21	21	21	20	21	21	20	20	19	19	18	18	19	18	18	18	18	19	19	18	18	18	19	19	19	19	19	20	19
	Temp	41	41	41	41	41	41	41	41	41	42	42	42	42	42	42	42	42	42	42	42	42	42	42	42	41	41	41	41	41	41	41	42
	VSR	63	63	62	62	63	62	62	62	62	62	61	61	60	59	58	58	59	59	61	60	61	61	61	62	62	62	63	64	64	64	63	61
September	Time	20	20	19	19	19	19	19	19	19	18	18	18	18	18	18	18	18	18	18	18	18	18	19	19	19	19	20	20	20	20		19
	Temp	41	41	41	41	41	41	41	41	41	41	41	41	41	41	42	42	42	42	41	41	41	41	41	41	41	41	41	41	41	41		41
	VSR	64	64	63	63	62	62	62	62	62	62	62	62	63	62	63	64	63	66	67	67	66	66	66	67	68	68	68	68	67	66		65
October	Time	20	19	19	19	19	20	20	20	19	19	19	20	19	19	19	19	19	19	19	19	19	19	18	19	19	19	18	18	18	18	18	19
	Temp	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	41	41	41	41	40	40	40	40	40
	VSR	66	67	64	64	64	65	65	66	67	66	66	65	65	66	66	66	66	66	64	63	63	66	65	64	64	64	65	65	66	69	69	65
November	Time	19	20	19	19	19	19	19	20	21	21	20	20	21	21	20	20	21	21	21	21	21	21	20	19	19	19	20	20	20	20		20
	Temp	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	39	39	39	39	39	39	39	39	39	39	39	39	39		39
	VSR	69	68	70	71	71	68	69	69	68	68	68	68	68	68	66	66	65	65	65	65	64	64	64	64	63	64	65	64	63	63	62	66
December	Time	20	19	19	19	19	19	20	20	20	20	20	19	19	19	20	19	19	19	19	19	19	19	19	18	19	20	20	20	20	20		20
	Temp	39	39	39	39	39	39	39	39	39	38	38	38	38	38	38	38	38	38	38	37	37	37	37	37	37	37	37	36	36	36	36	38
	VSR	63	63	63	64	64	64	63	65	69	70	69	69	69	69	69	69	69	70	71	71	71	70	70	69	66	65	65	65	64	65	66	67

Time is calculated as the minimum running 15-day average of the first stage digesters plus the running 15-day average across all second stage digesters as the plant operates in a series feed system. There is an allowance for grit accumulation in the formula by excluding the majority of the cone volume based on digester cleaning observations.

Temp is calculated as the lowest running 15-day average of all digesters in service.

VSR is calculated on a running 15-day average of individual samples calculated using the Van Kleeck method.

** Note: D2 Online temperature probe has failed in-situ and cannot be replaced until the digester is drained and cleaned. Manual temperature readings taken.

Pathogen and Vector Attraction Reduction (VAR)

Please note: this page of the spreadsheet must be printed out, signed at the bottom by the responsible official, and mailed to the EPA, as well as being returned with the rest of this spreadsheet (as an electronic file).

Pathogen Reduction for Class A Biosolids	If this facility produces Class A biosolids, please enter the appropriate code(s) in the box below. Include fecal coliform/salmonella results with monitoring results.
Codes to use for Pathogen Reduction of Class A Biosolids:	Code Description
Alternative 1	Time/Temperature (T&T)
Alternative 2	Alkaline Treatment (pH and T&T)
Alternative 3	Testing for 3 categories of pathogens, operational parameters
Alternative 4	Testing of accumulated biosolids for 3 categories of pathogens
PFRP 1	Composting
PFRP 2	Heat drying
PFRP 3	Heat treatment of liquid biosolids
PFRP 4	Thermophilic aerobic digestion
PFRP 5	Beta ray irradiation
PFRP 6	Gamma ray irradiation
PFRP 7	Pasteurization
Alternative 6	Equivalent PFRP

Pathogen Reduction for Class B Biosolids	If this facility produces Class B biosolids, please enter the appropriate code(s) in the box below. Include fecal coliform results, if applicable, with monitoring results.
Codes to use for Pathogen Reduction of Class B Biosolids:	Alternative 1, PSRP 3 Code Description
Alternative 1	Testing for fecal coliform, geometric mean of seven samples
PSRP 1	PSRP Method: aerobic digestion
PSRP 2	PSRP Method: air drying
PSRP 3	PSRP Method: anaerobic digestion
PSRP 4	PSRP Method: composting
PSRP 5	PSRP Method: lime stabilization
Alternative 3	Equivalent PSRP

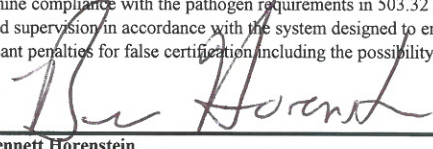
Vector Attraction Reduction (VAR)	Please enter the appropriate VAR compliance code in the box below:
Codes to use for VAR compliance:	1 Code Description
1	38% Volatile Solids Reduction
2	BENCH - Anaerobic Digestion
3	BENCH - Aerobic Digestion
4	Aerobic Digestion (SOUR)
5	"Aerobic Process": Composting
6	Alkaline stabilization: pH 12 for 2 hours, 11.5 for 22 hours
7	Drying: digested biosolids to 75%
8	Drying: undigested biosolids to 90%
9	Injection
10	Incorporation
11	Surface Disposal Daily Cover
12	Septage: pH 12 for 30 minutes
999	Not Applicable

Preparer's Certification Statement for Pathogen and Vector Attraction Reduction
40 CFR 503.17, as amended August 4, 1999

Please enter the compliance method number(s) in the statement below:

"I certify, under penalty of law, that the information that will be used to determine compliance with the pathogen requirements in 503.32 __ (b)2__ [and the vector attraction reduction requirements in 503.33 __ (b)1__] * was prepared under my direction and supervision in accordance with the system designed to ensure that qualified personnel properly gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment.

Signature of responsible official:


Bennett Horenstein
Director of Wastewater

*when vector attraction reduction is achieved during treatment

Pollutant Analytical Results

Please enter data for monthly sampling events.

If results are below the detection limit, enter "<" and the detection limit used

If results are not available for a pollutant, please use "N/A" as the qualifier

For fecal coliform, for Class B report geometric mean for each sampling period; for Class A report individual sample result, or maximum result if several samples taken during sampling period

Annual 40 CFR 503 Report submitted to EPA Region 9

Calendar Year 2015

Facility: EBMUD SD-1

		Sampling Event Date:												
		Sample Event 1	Sample Event 2	Sample Event 3	Sample Event 4	Sample Event 5	Sample Event 6	Sample Event 7	Sample Event 8	Sample Event 9	Sample Event 10	Sample Event 11	Sample Event 12	
Pollutant	Units	Annual Average	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	Amount, or Qualifier	
Arsenic (As)	mg/Kg	5.3	7.0	3.4	2.3	3.3	3.9	14	2.3	2.8	14	2.7	2.4	5.9
Cadmium (Cd)	mg/Kg	1.4	1.9	1.7	1.8	1.1	1.2	1.5	1.4	1.4	1.3	1.1	1.5	1.0
Chromium (Cr)	mg/Kg	41	48	42	42	38	39	38	40	40	43	39	39	38
Copper (Cu)	mg/Kg	360	350	350	360	350	340	350	370	380	380	360	350	360
Lead (Pb)	mg/Kg	42	58	42	40	64	32	30	29	31	40	37	51	48
Mercury (Hg)	mg/Kg	1.0	0.77	1.1	0.92	0.86	2.0	0.82	0.57	0.67	0.96	0.96	1.5	0.96
Molybdenum (Mo)	mg/Kg	10	7.5	8.4	11	11	9.3	10	12	11	11	13	12	8.8
Nickel (Ni)	mg/Kg	27	36	28	28	25	23	23	26	25	25	26	26	28
Selenium (Se)	mg/Kg	2.8	2.6	1.9	2.7	1.4	2.5	3.9	2.4	4.1	2.8	2.1	2.3	5.1
Zinc (Zn)	mg/Kg	730	710	640	730	730	680	700	700	760	780	780	750	770
Organic Nitrogen	mg/Kg	41000	40600	36900	37700	39300	38300	44000	44800	42100	42100	40300	43400	42400
Ammonium Nitrogen	mg/Kg	14000	15000	15000	14000	16000	15000	14000	13000	12000	13000	15000	13000	13000
Total Solids	%	23	22	23	24	22	23	22	23	24	24	24	23	25
Total Kjeldahl Nitrogen (TKN)	%	5.5	5.5	5.2	5.2	5.5	5.3	5.8	5.8	5.4	5.5	5.5	5.7	5.6
Ammonia (NH3)	%	1.4	1.5	1.5	1.4	1.6	1.5	1.4	1.3	1.2	1.3	1.5	1.3	1.3
Nitrite & Nitrate (NO2 & NO3)	%	0.00071	<0.000055	0.000913	0.00108	0.000682	0.001	0.00091	<0.000052	0.001	0.00071	0.00071	0.00052	0.00048
Phosphorous	%	1.40	1.36	1.40	2.90	1.27	1.18	1.13	1.03	1.69	1.33	1.29	1.08	1.09
Fecal Coliform geometric mean	MPN/g	19.99	9.22	17.41	8.44	19.32	16.97	34.56	29.89	9.13	16.08	20.93	38.39	19.53
Fecal Coliform max (Class A)	MPN/g	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Salmonella	MPN/4g	N//A	N//A	N//A	N//A	N//A	N//A	N//A	N//A	N//A	N//A	N//A	N//A	N//A
Helminth OVA	#/4g	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Enteric Virus	PFU/4g	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The Annual Average for data sets which include non-detect and detected but not quantified data have been calculated by the following method as part of our normal NPDES reporting requirements:

Data for the sample set are arranged from low-to-high in the following order: nondetect values, detected but not quantified values, and quantified values. The median point of this arrayed data set is presented as the average value if the data set is comprised of an odd number of samples. If the data set contains an even number of samples the numeric average of the two values surrounding the midpoint are presented with "<" as needed.

* Please note: Nitrite & Nitrate only reflects nitrate data as nitrite is not analyzed for.

MONITORING DATA SUMMARY

Annual 40 CFR 503 Report submitted to EPA Region 9

Calendar Year 2015

Facility: EBMUD SD-1

Final Use/Disposal Practice	Please enter information into this column.
How many biosolids analyses is this facility required to perform per monitoring year? (Please refer to the "Required Monitoring Frequency" table at right)	12
Are reported results represented on a 100% dry weight basis? (Y/N)	Y
Are fecal coliform results the geometric mean of 7 samples, if used for demonstrating Class B pathogen reduction (Y/N)	Y
If biosolids were land applied, were all the following metals sampled: As, Cd, Cu, Pb, Hg, Mo, Ni, Se, Zn? (Y/N/NA)	Y
If biosolids were surface disposed, were all the following metals sampled: As, Cr, and Ni? (Y/N/NA)	Y

Required Monitoring Frequency (Source: 40 CFR, Part 503)

Biosolids Production (DMT/yr)	Required Monitoring Frequency
>0 to <290	Once per year (1/yr)
290 to <1500	Once per quarter (4 samples/stockpile)
1500 to <15,000	Once per 60 days (6 samples /stockpile)
greater than or equal to 15,000	Once per month (12 samples/stockpile)

Pollutants: Please enter data in the cells to the right of each sampled pollutant type. Please use the indicated units for each pollutant type, in dry weight only. Report on 100% dry weight basis.

	Units	Yearly Average	Yearly Maximum	Analyses per Year	Comments / Methods Used
Arsenic (As)	mg/Kg	5.3	14	12	SW-846 EPA 7060
Cadmium (Cd)	mg/Kg	1.4	1.9	12	SW-846 EPA 3051A/6010
Chromium (Cr)	mg/Kg	41	48	12	SW-846 EPA 3051A/6010
Copper (Cu)	mg/Kg	360	380	12	SW-846 EPA 3051A/6010
Lead(Pb)	mg/Kg	42	64	12	SW-846 EPA 3051A/6010
Mercury (Hg)	mg/Kg	1.0	2.00	12	SW-846 EPA 7471
Molybdenum (Mo)	mg/Kg	10	13	12	SW-846 EPA 3051A/6010
Nickel (Ni)	mg/Kg	27	36	12	SW-846 EPA 3051A/6010
Selenium (Se)	mg/Kg	2.8	5.1	12	SW-846 EPA 7740
Zinc (Zn)	mg/Kg	730	780	12	SW-846 EPA 3051A/6010
Organic Nitrogen	mg/Kg	41000	44800	12	Standard Methods (20th Ed) 4500-N ORG C
Ammonium Nitrogen	mg/Kg	14000	16000	12	Standard Methods (20th Ed) 4500-NH3 B,C
Total Solids	%	23	25	101	Standard Methods (20th Ed) 2540B
Total Kjeldahl Nitrogen (TKN)	%	5.5	5.8	12	Standard Methods (20th Ed) 4500-N ORG C
Ammonia (NH3)	%	N/A	N/A	N/A	N/A
Nitrite & Nitrate (NO2 & NO3)	%	0.00071	0.00108	12	EPA 300.1
Phosphorous	%	1.40	2.9	12	AOC Methodology for Citric Acid Soluble P2O5
Fecal Coliform geometric mean	MPN/g	19.99	38.39	101	Standard Methods (20th Ed) 9221E
Fecal coliform max (Class A)	MPN/g	N/A	N/A	N/A	N/A
Salmonella	MPN/4g	N/A	N/A	N/A	N/A
Helminth OVA	#/4g	N/A	N/A	N/A	N/A
Enteric Virus	PFU/4g	N/A	N/A	N/A	N/A

Disposal of Biosolids in a Municipal Solid Waste Landfill

Paint Filter Test

TCLP

If biosolids were disposed of in a municipal solid waste landfill, please indicate whether the biosolids passed a Paint Filter Test and/or a Toxicity Characteristic Leaching Procedure (TCLP) test.	N/A	N/A
--	-----	-----

Enter Pass, Fail or N/A

Laboratories used (list each lab below; one row per lab):

Name of Laboratory	City and State where located	Dates used (i.e. "January - August")	Analyses performed: Inorganics, organics, pathogens, nutrients?
EBMUD Laboratory Services Division	Oakland, CA	January - December	Inorganics, organics, pathogens, nutrients
Soil & Plant Laboratory, Inc	San Jose, CA	January - June	Nutrient
Waypoint Analytical	Anaheim, CA	July - December	Nutrient

Contractors

Please include all contractors used for biosolids land application, treatment, disposal, and hauling this year.

(Add additional rows if more than 4 contractors, remember to increase print range too.)

Annual 40 CFR 503 Report submitted to EPA Region 9

Calendar Year 2015

Facility: EBMUD SD-1

Please type information into this column.

Contractor 1

Name	S & S Trucking
Street	477 Roland Way
City	Oakland
State	CA
County of Operations	Alameda, Solano, Contra Costa
Zip Code	94621
Contact Name	Frank Sanchez
Contact Phone	(510) 383-3556
Contact e-mail	frank@snsands.com
Type of operation(s)	Hauler
Dry metric tons handled	9,017

Contractor 2

Name	Denali Water Solutions
Street	12812 Valley View Street, Suite 9
City	Garden Grove
State	CA
County of Operations	Orange
Zip Code	92845
Contact Name	Chris Marks
Contact Phone	(760) 801-3175
Contact e-mail	ChrisAMarks@comcast.net
Type of operation(s)	Land Applier
Dry metric tons handled	6,947

Please type information into this column.

Contractor 3

Name	Denali Water Solutions
Street	12812 Valley View Street, Suite 9
City	Garden Grove
State	CA
County of Operations	Orange
Zip Code	92845
Contact Name	Chris Marks
Contact Phone	(760) 801-3175
Contact e-mail	ChrisAMarks@comcast.net
Type of operation(s)	Hauler
Dry metric tons handled	77

Contractor 4

Name	Lone Tree Trucking, Inc
Street	4001 Camino Diable Road
City	Byron
State	CA
County of Operations	Contra Costa
Zip Code	94514
Contact Name	Ken Botti
Contact Phone	(925) 634-4392
Contact e-mail	kentbotti@yahoo.com
Type of operation(s)	Hauler
Dry metric tons handled	5

Contractor 5

Name	
Street	
City	
State	
County of Operations	
Zip Code	
Contact Name	
Contact Phone	
Contact e-mail	
Type of operation(s)	
Dry metric tons handled	

Final Use and Disposal Practices

Weight units must be Dry Metric Tons (DMTY), 100% dry weight basis.

Annual 40 CFR 503 Report submitted to EPA Region 9

Calendar Year 2015

Facility: EBMUD SD-1

Total Annual Production	Composters specify biosolids received in this column	Composters report total volume of compost produced in this column.	
16,046			DMTY

Land application is spreading or injection of Class A or Class B biosolids, or materials derived from biosolids, for the purpose of growing crops or vegetation.

	Land Application of Class A biosolids:	Land Application of Class B biosolids:	
Agricultural Land		6,947	DMTY
Range Land			DMTY
Forest			DMTY
Reclamation Site			DMTY
Public Contact Site			DMTY
Sold or Given Away			DMTY
Lawn or Garden			DMTY
Total Land Application by Class		6,947	DMTY

Surface disposal is spreading, injection, or filling for the purpose of disposal. It includes sludge-only units at landfills.

SURFACE DISPOSAL	Total	With Liner & LCS	Without Liner & LCS
Amount Disposed, DMTY			

LANDFILL	Total	Landfill 1	Landfill 2	Landfill 3	Landfill 4	Landfill 5
Landfill Disposal, DMTY						
Landfill Cover (ADC or final), DMTY	9,100	5,035	2,882	626	551	5
Landfill Name		Potero Hills LF	Vasco Road Sanitary LF	Altamont Sanitary LF	Newby Island Sanitary LF	Keller Canyon LF
Does Landfill meet 40CFR258? (Y/N)	Y	Y	Y	Y	Y	Y

RECEIVED FROM ANOTHER FACILITY	Total	Facility 1	Facility 2	Facility 3	Facility 4
Amount Received From Other Facilities, DMTY					
Name of facility (fill out a column for each facility)					
Address of facility					
Type of facility (POTW, other)					

TRANSFERRED TO ANOTHER FACILITY	Total	Facility 1	Facility 2	Facility 3	Facility 4
Amount Transferred To Other Facilities, DMTY					
Name of the other facility					
Address of facility					
Type of facility (POTW, composter, other)					

ADDITIONAL INFORMATION	
Amount Subjected to Other Use or Disposal, DMTY	
If applicable, please specify the other use or disposal METHOD in the cell to the right:	
Amount Stored, DMTY	
Amount in Long-Term Treatment, DMTY	

Biogas

Information on your facility's biogas production, management and use.

Annual 40 CFR 503 Report submitted to EPA Region 9
Calendar Year 2015
Facility: EBMUD SD-1

Note: entry of information on this page is purely voluntary for those wishing to share biogas data, and is not required as part of 40 CFR 503 reporting requirements or being requested as part of other U.S. EPA requirements

Does your facility use biogas? (Y/N) Y If no, please explain why not: _____

Biogas Generation

Biogas Chemistry			Volume Produced			Storage Capacity, if any		
		Other (please specify)			Other (please specify)			Other (please specify)
	% CH4	% CO2	O2, N2, H2, H2S	Cubic-Feet/Day	Cubic-Feet/Year	Storage Type*	Capacity (cubic feet)	
	64.3	34.1	1.6	3,135,000	1,144,554,000			

* e.g. flexible membrane covers, no storage

Biogas Utilization

	IC Engine	Turbine	Microturbines	Boiler	Fuel Cell	CNG/LNG	Direct pipeline injection	Flare	Other (please specify)
Percentage of biogas used by each of the following:	41%	47%	N/A	0%	N/A	N/A	N/A	12%	N/A
Electricity (MWh/year): <i>If applicable, amount of electricity produced.</i>	27,644	34,509	N/A		N/A				N/A
Heat (therms/year): <i>If applicable, amount of heat produced.</i>			N/A		N/A				N/A
Fuel (GGE/year): <i>If applicable, total fuel produced during year.</i>						N/A	N/A		N/A

Biogas Conditioning

	Pre-Combustion Treatment					Post-Combustion Treatment			
	Moisture	Siloxane	CO2	H2S	Other (please specify)	VOCs	N0x	CO	Other (please specify)
<i>If applicable, technology used for biogas conditioning prior to combustion or for post-combustion treatment.</i>	Chiller	Carbon Bed	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Co-digestion

	Outside Waste (Y/N)	FOG	Industrial food waste	Post-consumer food waste	Agricultural Waste	Other (please specify)
Co-digestion: <i>Does your facility receive organic waste to enhance biogas production? If yes what types of organic waste? (Y/N)</i>	Y	Y	Y	Y	Y	
Waste Quantity: <i>How much organic waste did your facility accept this year? (Specify units, e.g. gallons per day, tons per day)</i>						

Co-digestion benefit

	Percent Increase
Biogas Increase: <i>Has co-digestion increased biogas production? If so, by how much?</i>	25%

Additional sources of Biogas

	Additional Source	Quantity received cubic-feet/day	Quantity received cubic-feet/year
Additional Sources: Does your facility use biogas from other sources (e.g. a nearby landfill). If so, please specify the source and the quantity.	N/A		



**12812 Valley View Ave., #9
Garden Grove, CA 92845**

Annual Biosolids Report

East Bay Municipal Utility District

2015



*12812 Valley View Ave., #9
Garden Grove, CA 92845*

January 21, 2016

Alicia Chakrabarti
East Bay Municipal Utility District
375 Eleventh St.
Oakland, CA 94607

Dear Ms. Chakrabarti:

Re: 2015 Annual Report

Attached is Denali Water Solutions' 2015 Annual Biosolids Report for East Bay Municipal Utility District.

Enclosed is the Annual Report. Included in this report are annual application reports, field reports, site maps, and a certification statement certifying federal and state requirements were met with our land application operations.

If you have any questions, feel free to call me at (760) 801-3175.

Sincerely,

Chris Marks

Table of Contents

- **Annual Application Reports 2015**
- **Field Reports**
- **Field Maps**
- **Certification Statement**

Annual Application Reports

East Bay MUD Application Summary - 2015

Field Code: ME 3-3
Date: 2/1/2016
Total Acres: 131.4
Tax Assessors Parcel No. 042-220-008, 042-230-54
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 28#/acre
Date Started: 10/1/2015
Seeding Date: December-15
Harvesting Date: May-16

Wet Tons Applied For Current Year: 5840.95
Dry Tons Applied For Current Year: 1268.07
Wet Metric Tons Applied For Current Year: 5302.41
Dry Metric Tons Applied For Current Year: 1151.15
Wet Tons/Acre Applied For Current Year: 44.45
Dry Tons/Acre Applied For Current Year: 9.65
Wet Metric Tons/ha Applied For Current Year: 99.69
Dry Metric Tons/ha Applied For Current Year: 21.64

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	758.86	887.86
NH3	29.46	34.47
NO3	1.11	1.30
Organic N	728.28	852.09
As	0.03	0.04
Cd	0.02	0.03
Cr	0.48	0.57
Cu	5.34	6.25
Pb	0.40	0.47
Hg	0.01	0.01
Mo	0.16	0.19
Ni	0.26	0.31
Se	0.00	0.00
Zn	13.64	15.96
PAN	161.50	188.95
P	549.34	642.73

East Bay MUD Application Summary - 2015

Field Code: ME 3-4
Date: 2/1/2016
Total Acres: 47.1
Tax Assessors Parcel No. 042-220-008, 043-070-41
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 109#/acre
Date Started: 9/24/2015
Seeding Date: November-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 1961.87
Dry Tons Applied For Current Year: 425.92
Wet Metric Tons Applied For Current Year: 1780.99
Dry Metric Tons Applied For Current Year: 386.65
Wet Tons/Acre Applied For Current Year: 41.65
Dry Tons/Acre Applied For Current Year: 9.04
Wet Metric Tons/ha Applied For Current Year: 93.41
Dry Metric Tons/ha Applied For Current Year: 20.28

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	711.08	831.97
NH3	27.61	32.30
NO3	1.04	1.22
Organic N	682.44	798.45
As	0.03	0.04
Cd	0.02	0.03
Cr	0.45	0.53
Cu	5.01	5.86
Pb	0.38	0.44
Hg	0.01	0.01
Mo	0.15	0.18
Ni	0.25	0.29
Se	0.00	0.00
Zn	12.78	14.96
PAN	151.33	177.06
P	514.74	602.25

East Bay MUD Application Summary - 2015

Field Code: ME 3-6
Date: 2/1/2016
Total Acres: 25.1
Tax Assessors Parcel No. 043-070-41
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 28#/acre
Date Started: 4/9/2015
Seeding Date: May-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 1261.10
Dry Tons Applied For Current Year: 239.36
Wet Metric Tons Applied For Current Year: 1144.83
Dry Metric Tons Applied For Current Year: 217.29
Wet Tons/Acre Applied For Current Year: 50.24
Dry Tons/Acre Applied For Current Year: 9.54
Wet Metric Tons/ha Applied For Current Year: 112.67
Dry Metric Tons/ha Applied For Current Year: 21.39

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	861.76	1008.26
NH3	6.21	7.27
NO3	0.73	0.85
Organic N	854.82	1000.14
As	0.00	0.00
Cd	0.02	0.02
Cr	0.53	0.62
Cu	5.74	6.72
Pb	0.48	0.56
Hg	0.00	0.00
Mo	0.14	0.17
Ni	0.29	0.34
Se	0.05	0.06
Zn	13.76	16.10
PAN	174.80	204.52
P	542.72	634.98

East Bay MUD Application Summary - 2015

Field Code: ME 3-7
Date: 2/1/2016
Total Acres: 138.1
Tax Assessors Parcel No. 043-070-41, 043-100-014
Crop: Forage Mix
Crop Nitrogen Usage: 225#/acre
Residual Nitrogen 0#/acre
Date Started: 7/16/2015
Seeding Date: September-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 3733.61
Dry Tons Applied For Current Year: 793.39
Wet Metric Tons Applied For Current Year: 3389.37
Dry Metric Tons Applied For Current Year: 720.24
Wet Tons/Acre Applied For Current Year: 27.04
Dry Tons/Acre Applied For Current Year: 5.75
Wet Metric Tons/ha Applied For Current Year: 60.63
Dry Metric Tons/ha Applied For Current Year: 12.88

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	411.85	481.86
NH3	25.66	30.02
NO3	0.99	1.16
Organic N	385.20	450.68
As	0.01	0.01
Cd	0.00	0.00
Cr	0.06	0.07
Cu	0.60	0.70
Pb	0.05	0.06
Hg	0.00	0.00
Mo	0.02	0.02
Ni	0.04	0.04
Se	0.00	0.00
Zn	1.07	1.25
PAN	90.86	106.31
P	350.03	409.53

East Bay MUD Application Summary - 2015

Field Code: ME 3-9
Date: 2/1/2016
Total Acres: 28.1
Tax Assessors Parcel No. 043-70-041
Crop: Forage Mix
Crop Nitrogen Usage: 250#/acre
Residual Nitrogen 103#/acre
Date Started: 3/31/2015
Seeding Date: May-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 207.03
Dry Tons Applied For Current Year: 39.29
Wet Metric Tons Applied For Current Year: 187.94
Dry Metric Tons Applied For Current Year: 35.67
Wet Tons/Acre Applied For Current Year: 7.37
Dry Tons/Acre Applied For Current Year: 1.40
Wet Metric Tons/ha Applied For Current Year: 16.52
Dry Metric Tons/ha Applied For Current Year: 3.14

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	126.37	147.85
NH3	0.91	1.07
NO3	0.11	0.13
Organic N	125.35	146.66
As	0.00	0.00
Cd	0.00	0.00
Cr	0.08	0.09
Cu	0.84	0.99
Pb	0.07	0.08
Hg	0.00	0.00
Mo	0.02	0.02
Ni	0.04	0.05
Se	0.01	0.01
Zn	2.02	2.36
PAN	25.63	29.99
P	79.58	93.11

East Bay MUD Application Summary - 2015

Field Code: ME 3-10
Date: 2/1/2016
Total Acres: 30.4
Tax Assessors Parcel No. 043-100-014
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 11#/acre
Date Started: 5/29/2015
Seeding Date: July-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 528.26
Dry Tons Applied For Current Year: 114.00
Wet Metric Tons Applied For Current Year: 479.55
Dry Metric Tons Applied For Current Year: 103.49
Wet Tons/Acre Applied For Current Year: 17.38
Dry Tons/Acre Applied For Current Year: 3.75
Wet Metric Tons/ha Applied For Current Year: 38.97
Dry Metric Tons/ha Applied For Current Year: 8.41

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	319.84	374.21
NH3	21.19	24.79
NO3	0.57	0.67
Organic N	298.08	348.75
As	0.00	0.00
Cd	0.01	0.01
Cr	0.01	0.01
Cu	2.62	3.07
Pb	0.00	0.00
Hg	0.00	0.00
Mo	0.00	0.00
Ni	0.02	0.02
Se	0.07	0.08
Zn	5.56	6.50
PAN	70.78	82.82
P	213.43	249.71

East Bay MUD Application Summary - 2015

Field Code: ME 3-11
Date: 2/1/2016
Total Acres: 119.2
Tax Assessors Parcel No. 043-100-014
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 69#/acre
Date Started: 4/21/2015
Seeding Date: June-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 6122.77
Dry Tons Applied For Current Year: 1278.79
Wet Metric Tons Applied For Current Year: 5558.25
Dry Metric Tons Applied For Current Year: 1160.89
Wet Tons/Acre Applied For Current Year: 51.37
Dry Tons/Acre Applied For Current Year: 10.73
Wet Metric Tons/ha Applied For Current Year: 115.19
Dry Metric Tons/ha Applied For Current Year: 24.06

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	928.24	1086.04
NH3	47.61	55.70
NO3	1.44	1.69
Organic N	879.19	1028.65
As	0.00	0.00
Cd	0.02	0.03
Cr	0.16	0.19
Cu	7.25	8.49
Pb	0.13	0.15
Hg	0.00	0.00
Mo	0.04	0.05
Ni	0.12	0.14
Se	0.16	0.19
Zn	15.80	18.49
PAN	201.08	235.27
P	610.57	714.37

East Bay MUD Application Summary - 2015

Field Code: ME 3-12
Date: 2/1/2016
Total Acres: 25
Tax Assessors Parcel No. 043-100-014
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 42#/acre
Date Started: 9/1/2015
Seeding Date: October-15
Harvesting Date: March-16

Wet Tons Applied For Current Year: 931.97
Dry Tons Applied For Current Year: 202.33
Wet Metric Tons Applied For Current Year: 846.04
Dry Metric Tons Applied For Current Year: 183.68
Wet Tons/Acre Applied For Current Year: 37.28
Dry Tons/Acre Applied For Current Year: 8.09
Wet Metric Tons/ha Applied For Current Year: 83.60
Dry Metric Tons/ha Applied For Current Year: 18.15

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	636.40	744.59
NH3	24.71	28.91
NO3	0.93	1.09
Organic N	610.76	714.59
As	0.03	0.03
Cd	0.02	0.02
Cr	0.41	0.48
Cu	4.48	5.24
Pb	0.34	0.40
Hg	0.00	0.01
Mo	0.14	0.16
Ni	0.22	0.26
Se	0.00	0.00
Zn	11.44	13.39
PAN	135.44	158.46
P	460.68	538.99

East Bay MUD Application Summary - 2015

Field Code: ME 3-13E
Date: 2/1/2016
Total Acres: 20
Tax Assessors Parcel No. 043-100-014
Crop: Double Forage Mix
Crop Nitrogen Usage: 500#/acre
Residual Nitrogen 71#/acre
Date Started: 6/17/2015
Seeding Date: July-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 1641.00
Dry Tons Applied For Current Year: 354.13
Wet Metric Tons Applied For Current Year: 1489.70
Dry Metric Tons Applied For Current Year: 321.48
Wet Tons/Acre Applied For Current Year: 82.05
Dry Tons/Acre Applied For Current Year: 17.71
Wet Metric Tons/ha Applied For Current Year: 184.00
Dry Metric Tons/ha Applied For Current Year: 39.71

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	1510.21	1766.95
NH3	100.05	117.06
NO3	2.71	3.17
Organic N	1407.45	1646.72
As	0.00	0.00
Cd	0.04	0.04
Cr	0.04	0.04
Cu	12.39	14.50
Pb	0.00	0.00
Hg	0.00	0.00
Mo	0.00	0.00
Ni	0.09	0.10
Se	0.32	0.37
Zn	26.25	30.71
PAN	334.23	391.05
P	1007.77	1179.09

East Bay MUD Application Summary - 2015

Field Code: ME 3-14
Date: 2/1/2016
Total Acres: 91.1
Tax Assessors Parcel No. 043-100-014
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 71#/acre
Start Date: 6/17/2015
Seeding Date: August-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 3864.29
Dry Tons Applied For Current Year: 829.67
Wet Metric Tons Applied For Current Year: 3508.00
Dry Metric Tons Applied For Current Year: 753.17
Wet Tons/Acre Applied For Current Year: 42.42
Dry Tons/Acre Applied For Current Year: 9.11
Wet Metric Tons/ha Applied For Current Year: 95.13
Dry Metric Tons/ha Applied For Current Year: 20.42

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	735.77	860.85
NH3	47.89	56.04
NO3	1.45	1.70
Organic N	686.43	803.12
As	0.00	0.00
Cd	0.01	0.02
Cr	0.04	0.05
Cu	4.59	5.37
Pb	0.03	0.03
Hg	0.00	0.00
Mo	0.01	0.01
Ni	0.05	0.06
Se	0.11	0.13
Zn	9.61	11.24
PAN	162.69	190.34
P	537.23	628.56

East Bay MUD Application Summary - 2015

Field Code: ME 3-16
Date: 2/1/2016
Total Acres: 316.6
Tax Assessors Parcel No. 043-100-014, 042-100-017
Crop: Corn+Wheat Hay
Crop Nitrogen Usage: 425#/acre
Residual Nitrogen 119#/acre
Date Started: 9/1/2015
Seeding Date: December-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 2063.87
Dry Tons Applied For Current Year: 448.07
Wet Metric Tons Applied For Current Year: 1873.58
Dry Metric Tons Applied For Current Year: 406.75
Wet Tons/Acre Applied For Current Year: 6.52
Dry Tons/Acre Applied For Current Year: 1.42
Wet Metric Tons/ha Applied For Current Year: 14.62
Dry Metric Tons/ha Applied For Current Year: 3.17

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	111.29	130.21
NH3	4.32	5.06
NO3	0.16	0.19
Organic N	106.80	124.96
As	0.00	0.01
Cd	0.00	0.00
Cr	0.07	0.08
Cu	0.78	0.92
Pb	0.06	0.07
Hg	0.00	0.00
Mo	0.02	0.03
Ni	0.04	0.05
Se	0.00	0.00
Zn	2.00	2.34
PAN	23.68	27.71
P	80.56	94.25

East Bay MUD Application Summary - 2015

Field Code: ME 3-21
Date: 2/1/2016
Total Acres: 33.64
Tax Assessors Parcel No. 043-100-014
Crop: Forage Mix
Crop Nitrogen Usage: 250#/acre
Residual Nitrogen 0#/acre
Date Started: 7/1/2015
Seeding Date: August-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 1055.26
Dry Tons Applied For Current Year: 224.24
Wet Metric Tons Applied For Current Year: 957.97
Dry Metric Tons Applied For Current Year: 203.57
Wet Tons/Acre Applied For Current Year: 31.37
Dry Tons/Acre Applied For Current Year: 6.67
Wet Metric Tons/ha Applied For Current Year: 70.35
Dry Metric Tons/ha Applied For Current Year: 14.95

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	478.09	559.36
NH3	29.78	34.85
NO3	1.15	1.35
Organic N	447.15	523.17
As	0.01	0.01
Cd	0.00	0.00
Cr	0.07	0.08
Cu	0.70	0.82
Pb	0.06	0.07
Hg	0.00	0.00
Mo	0.02	0.03
Ni	0.04	0.05
Se	0.00	0.00
Zn	1.24	1.46
PAN	105.47	123.40
P	421.84	493.55

East Bay MUD Application Summary - 2015

Field Code: ME 3-22
Date: 2/1/2016
Total Acres: 28.68
Tax Assessors Parcel No. 043-100-017
Crop: Forage Mix
Crop Nitrogen Usage: 250#/acre
Residual Nitrogen 0#/acre
Start Date 8/11/2015
Seeding Date: September-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 878.88
Dry Tons Applied For Current Year: 186.76
Wet Metric Tons Applied For Current Year: 797.85
Dry Metric Tons Applied For Current Year: 169.54
Wet Tons/Acre Applied For Current Year: 30.64
Dry Tons/Acre Applied For Current Year: 6.51
Wet Metric Tons/ha Applied For Current Year: 68.72
Dry Metric Tons/ha Applied For Current Year: 14.60

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	466.48	545.79
NH3	29.06	34.00
NO3	1.12	1.31
Organic N	436.30	510.47
As	0.01	0.01
Cd	0.00	0.00
Cr	0.07	0.08
Cu	0.68	0.80
Pb	0.06	0.07
Hg	0.00	0.00
Mo	0.02	0.03
Ni	0.04	0.05
Se	0.00	0.00
Zn	1.21	1.42
PAN	102.91	120.41
P	370.66	433.67

East Bay MUD Application Summary - 2015

Field Code: ME 3-24
Date: 2/1/2016
Total Acres: 40.09
Tax Assessors Parcel No. 043-100-017
Crop: Forage Mix
Crop Nitrogen Usage: 250#/acre
Residual Nitrogen 72#/acre
Field Start Date: 8/11/2015
Seeding Date: September-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 1129.75
Dry Tons Applied For Current Year: 240.07
Wet Metric Tons Applied For Current Year: 1025.59
Dry Metric Tons Applied For Current Year: 217.94
Wet Tons/Acre Applied For Current Year: 28.18
Dry Tons/Acre Applied For Current Year: 5.99
Wet Metric Tons/ha Applied For Current Year: 63.20
Dry Metric Tons/ha Applied For Current Year: 13.43

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	428.98	501.90
NH3	26.72	31.27
NO3	1.03	1.21
Organic N	401.22	469.43
As	0.01	0.01
Cd	0.00	0.00
Cr	0.06	0.07
Cu	0.63	0.73
Pb	0.05	0.06
Hg	0.00	0.00
Mo	0.02	0.02
Ni	0.04	0.05
Se	0.00	0.00
Zn	1.12	1.31
PAN	94.64	110.73
P	340.85	398.80

East Bay MUD Application Summary - 2015

Field Code: ME 3-25
Date: 2/1/2016
Total Acres: 16.16
Tax Assessors Parcel No. 043-100-017
Crop: Forage Mix
Crop Nitrogen Usage: 250#/acre
Residual Nitrogen 7#/acre
Date Started 9/1/2015
Seeding Date: October-15
Harvesting Date: March-16

Wet Tons Applied For Current Year: 579.97
Dry Tons Applied For Current Year: 125.91
Wet Metric Tons Applied For Current Year: 526.50
Dry Metric Tons Applied For Current Year: 114.30
Wet Tons/Acre Applied For Current Year: 35.89
Dry Tons/Acre Applied For Current Year: 7.79
Wet Metric Tons/ha Applied For Current Year: 80.48
Dry Metric Tons/ha Applied For Current Year: 17.47

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	612.68	716.84
NH3	23.79	27.83
NO3	0.90	1.05
Organic N	588.00	687.96
As	0.03	0.03
Cd	0.02	0.02
Cr	0.39	0.46
Cu	4.31	5.05
Pb	0.33	0.38
Hg	0.00	0.01
Mo	0.13	0.15
Ni	0.21	0.25
Se	0.00	0.00
Zn	11.01	12.89
PAN	130.39	152.56
P	443.51	518.90

East Bay MUD Application Summary - 2015

Field Code: ME 3-26
Date: 2/1/2016
Total Acres: 18.88
Tax Assessors Parcel No. 043-100-017
Crop: Forage Mix
Crop Nitrogen Usage: 250#/acre
Residual Nitrogen 148#/acre
Date Started: 8/24/2015
Seeding Date: September-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 350.29
Dry Tons Applied For Current Year: 74.44
Wet Metric Tons Applied For Current Year: 317.99
Dry Metric Tons Applied For Current Year: 67.57
Wet Tons/Acre Applied For Current Year: 18.55
Dry Tons/Acre Applied For Current Year: 3.94
Wet Metric Tons/ha Applied For Current Year: 41.61
Dry Metric Tons/ha Applied For Current Year: 8.84

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	282.43	330.44
NH3	17.60	20.59
NO3	0.68	0.80
Organic N	264.16	309.06
As	0.00	0.00
Cd	0.00	0.00
Cr	0.04	0.05
Cu	0.41	0.48
Pb	0.03	0.04
Hg	0.00	0.00
Mo	0.01	0.02
Ni	0.03	0.03
Se	0.00	0.00
Zn	0.73	0.86
PAN	62.31	72.90
P	224.41	262.56

East Bay MUD Application Summary - 2015

Field Code: ME 3-28
Date: 2/1/2016
Total Acres: 56.12
Tax Assessors Parcel No. 043-100-017
Crop: Forage Mix
Crop Nitrogen Usage: 250#/acre
Residual Nitrogen 150#/acre
Date Started: 8/24/2015
Seeding Date: September-15
Harvesting Date: April-16

Wet Tons Applied For Current Year: 880.89
Dry Tons Applied For Current Year: 187.19
Wet Metric Tons Applied For Current Year: 799.67
Dry Metric Tons Applied For Current Year: 169.93
Wet Tons/Acre Applied For Current Year: 15.70
Dry Tons/Acre Applied For Current Year: 3.34
Wet Metric Tons/ha Applied For Current Year: 35.20
Dry Metric Tons/ha Applied For Current Year: 7.48

Source: East Bay MUD

Constituent	lbs/acre Applied	kg/hectare Applied
TKN	238.94	279.56
NH3	14.89	17.42
NO3	0.57	0.67
Organic N	223.48	261.47
As	0.00	0.00
Cd	0.00	0.00
Cr	0.03	0.04
Cu	0.35	0.41
Pb	0.03	0.03
Hg	0.00	0.00
Mo	0.01	0.01
Ni	0.02	0.03
Se	0.00	0.00
Zn	0.62	0.73
PAN	52.71	61.68
P	189.86	222.13

Field Reports

Annual Field Report - 2015

Field Code: ME 3-3
 Date: 2/1/2016
 Total Acres: 131.4
 Tax Assessors Parcel No. 042-220-008, 042-230-54
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 28#/acre
 Date Started: 1/1/2015
 Seeding Date: December-15
 Harvesting Date: May-16

Wet Tons Applied: 17358.47
 Dry Tons Applied: 2321.40
 Metric Tons Applied: 15758.02
 Metric Dry Tons Applied: 2107.37
 Wet Metric Tons/ha: 296.26
 Dry Metric Tons/ha: 39.62
 Wet Tons Applied/acre: 132.10

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	1260.30	1124.69	3390.11
NH3	121.84	108.73	212.17
NO3	16.68	14.89	17.95
Organic N	1121.77	1001.07	3159.99
As	0.28	0.25	0.40
Cd	0.04	0.04	0.17
Cr	1.14	1.02	2.71
Cu	8.68	7.74	25.46
Pb	0.55	0.49	1.63
Hg	0.01	0.01	0.02
Mo	0.27	0.24	0.63
Ni	0.44	0.39	1.34
Se	0.02	0.02	0.19
Zn	23.94	21.36	59.43
PAN	301.96	269.47	NA
P	1008.70	900.16	1701.27

Annual Field Report - 2015

Field Code: ME 3-4
 Date: 2/1/2016
 Total Acres: 47.1
 042-220-008, 043-070-41
 Tax Assessors Parcel No. 41
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 109#/acre
 Date Started: 9/24/2015
 Seeding Date: November-15
 Harvesting Date: April-16

Wet Tons Applied: 3065.87
 Dry Tons Applied: 463.55
 Metric Tons Applied: 2783.20
 Metric Dry Tons Applied: 420.81
 Wet Metric Tons/ha: 145.98
 Dry Metric Tons/ha: 22.07
 Wet Tons Applied/acre: 65.09

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	839.91	749.54	4406.10
NH3	33.04	29.48	511.06
NO3	1.26	1.13	3.79
Organic N	805.61	718.93	3891.25
As	0.04	0.03	0.32
Cd	0.03	0.02	0.23
Cr	0.53	0.48	5.93
Cu	5.86	5.23	36.50
Pb	0.44	0.39	1.89
Hg	0.01	0.01	0.05
Mo	0.18	0.16	1.16
Ni	0.29	0.26	2.73
Se	0.00	0.00	0.40
Zn	14.98	13.37	81.36
PAN	178.90	159.65	NA
P	602.25	537.45	2895.00

Annual Field Report - 2015

Field Code: ME 3-6
 Date: 2/1/2016
 Total Acres: 25.1
 Tax Assessors Parcel No. 043-070-41
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 28#/acre
 Date Started: 4/9/2015
 Seeding Date: May-15
 Harvesting Date: April-16

Wet Tons Applied: 2214.16
 Dry Tons Applied: 406.39
 Metric Tons Applied: 2010.01
 Metric Dry Tons Applied: 368.92
 Wet Metric Tons/ha: 197.83
 Dry Metric Tons/ha: 36.31
 Wet Tons Applied/acre: 88.21

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	1827.37	1630.74	2855.02
NH3	13.71	12.23	59.83
NO3	1.28	1.14	1.70
Organic N	1812.38	1617.37	2793.49
As	0.02	0.02	0.09
Cd	0.04	0.04	0.11
Cr	0.91	0.82	1.76
Cu	13.28	11.85	20.59
Pb	0.83	0.74	1.47
Hg	0.00	0.00	0.01
Mo	0.28	0.25	0.42
Ni	0.51	0.46	0.98
Se	0.14	0.12	0.16
Zn	33.61	29.99	50.16
PAN	370.61	330.73	NA
P	919.83	820.86	1226.28

Annual Field Report - 2015

Field Code: ME 3-7
 Date: 2/1/2016
 Total Acres: 138.1
 043-070-41, 043-100-014
 Tax Assessors Parcel No.
 Crop: Forage Mix
 Crop Nitrogen Usage: 225#/acre
 Residual Nitrogen 0#/acre
 Date Started: 7/16/2015
 Seeding Date: September-15
 Harvesting Date: April-16

Wet Tons Applied: 4992.47
 Dry Tons Applied: 993.74
 Metric Tons Applied: 4532.16
 Metric Dry Tons Applied: 902.12
 Wet Metric Tons/ha: 81.07
 Dry Metric Tons/ha: 16.14
 Wet Tons Applied/acre: 36.15

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	650.49	580.49	2816.42
NH3	34.07	30.41	161.21
NO3	1.24	1.11	5.64
Organic N	615.17	548.98	2649.58
As	0.01	0.01	0.18
Cd	0.00	0.00	0.15
Cr	0.08	0.07	1.76
Cu	0.91	0.81	19.07
Pb	0.07	0.07	1.27
Hg	0.00	0.00	0.02
Mo	0.03	0.03	0.38
Ni	0.05	0.05	0.93
Se	0.00	0.00	0.11
Zn	1.77	1.58	37.13
PAN	141.31	126.11	NA
P	542.07	483.75	1367.08

Annual Field Report - 2015

Field Code: ME 3-9
 Date: 2/1/2016
 Total Acres: 28.1
 Tax Assessors Parcel No. 043-70-041
 Crop: Forage Mix
 Crop Nitrogen Usage: 250#/acre
 Residual Nitrogen 103#/acre
 Date Started: 3/31/2015
 Seeding Date: May-15
 Harvesting Date: April-16

Wet Tons Applied: 868.91
 Dry Tons Applied: 159.60
 Metric Tons Applied: 788.80
 Metric Dry Tons Applied: 144.88
 Wet Metric Tons/ha: 69.35
 Dry Metric Tons/ha: 12.74
 Wet Tons Applied/acre: 30.92

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	662.25	591.00	3659.32
NH3	5.39	4.81	601.94
NO3	0.40	0.36	48.70
Organic N	656.46	585.83	3008.68
As	0.02	0.02	0.98
Cd	0.02	0.01	0.32
Cr	0.28	0.25	5.59
Cu	5.50	4.91	66.18
Pb	0.25	0.22	8.26
Hg	0.00	0.00	0.25
Mo	0.10	0.09	1.92
Ni	0.16	0.14	2.96
Se	0.06	0.05	0.89
Zn	13.80	12.32	191.23
PAN	134.39	119.93	NA
P	290.18	258.95	1832.95

Annual Field Report - 2015

Field Code: ME 3-10
 Date: 2/1/2016
 Total Acres: 30.4
 Tax Assessors Parcel No. 043-100-014
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 11#/acre
 Date Started: 5/29/2015
 Seeding Date: July-15
 Harvesting Date: April-16

Wet Tons Applied: 723.53
 Dry Tons Applied: 146.47
 Metric Tons Applied: 656.82
 Metric Dry Tons Applied: 132.97
 Wet Metric Tons/ha: 53.37
 Dry Metric Tons/ha: 10.81
 Wet Tons Applied/acre: 23.80

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	1282.73	1144.71	2611.58
NH3	61.74	55.09	182.01
NO3	1.48	1.33	2.07
Organic N	1219.51	1088.29	2427.50
As	0.00	0.00	0.09
Cd	0.02	0.02	0.18
Cr	0.02	0.02	1.34
Cu	10.70	9.55	24.47
Pb	0.00	0.00	0.72
Hg	0.00	0.00	0.02
Mo	0.00	0.00	0.27
Ni	0.04	0.03	0.70
Se	0.23	0.21	0.28
Zn	27.13	24.21	53.66
PAN	276.25	246.53	NA
P	581.67	519.08	1339.77

Annual Field Report - 2015

Field Code: ME 3-11
 Date: 2/1/2016
 Total Acres: 119.2
 Tax Assessors Parcel No. 043-100-014
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 69#/acre
 Date Started: 4/21/2015
 Seeding Date: June-15
 Harvesting Date: April-16

Wet Tons Applied: 10028.40
 Dry Tons Applied: 1963.67
 Metric Tons Applied: 9103.78
 Metric Dry Tons Applied: 1782.62
 Wet Metric Tons/ha: 188.67
 Dry Metric Tons/ha: 36.94
 Wet Tons Applied/acre: 84.13

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	1782.25	1590.48	4626.45
NH3	84.72	75.60	332.24
NO3	2.22	1.98	8.42
Organic N	1695.31	1512.89	4285.79
As	0.00	0.00	0.30
Cd	0.04	0.03	0.14
Cr	0.25	0.23	2.51
Cu	13.65	12.18	36.36
Pb	0.20	0.18	2.60
Hg	0.00	0.00	0.05
Mo	0.07	0.06	0.58
Ni	0.18	0.16	1.59
Se	0.34	0.30	0.49
Zn	32.87	29.33	95.26
PAN	383.64	342.36	NA
P	917.18	818.50	1923.24

Annual Field Report - 2015

Field Code: ME 3-12
 Date: 2/1/2016
 Total Acres: 25
 Tax Assessors Parcel No. 043-100-014
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 42#/acre
 Date Started: 9/1/2015
 Seeding Date: October-15
 Harvesting Date: March-16

Wet Tons Applied: 1745.01
 Dry Tons Applied: 358.13
 Metric Tons Applied: 1584.12
 Metric Dry Tons Applied: 325.11
 Wet Metric Tons/ha: 156.53
 Dry Metric Tons/ha: 32.13
 Wet Tons Applied/acre: 69.80

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	1456.59	1299.86	2696.82
NH3	41.19	36.76	90.59
NO3	1.44	1.28	2.49
Organic N	1413.96	1261.82	2603.74
As	0.08	0.07	0.24
Cd	0.05	0.04	0.09
Cr	0.81	0.72	1.30
Cu	10.10	9.01	21.52
Pb	0.73	0.65	1.12
Hg	0.02	0.01	0.03
Mo	0.33	0.29	0.54
Ni	0.43	0.38	0.73
Se	0.02	0.02	0.08
Zn	31.38	28.00	66.78
PAN	304.83	272.03	NA
P	1083.29	966.73	1873.60

Annual Field Report - 2015

Field Code: ME 3-13E
 Date: 2/1/2016
 Total Acres: 20
 Tax Assessors Parcel No. 043-100-014
 Crop: Double Forage Mix
 Crop Nitrogen Usage: 500#/acre
 Residual Nitrogen 71#/acre
 Date Started: 6/17/2015
 Seeding Date: July-15
 Harvesting Date: April-16

Wet Tons Applied: 1641.00
 Dry Tons Applied: 354.12
 Metric Tons Applied: 1489.70
 Metric Dry Tons Applied: 321.47
 Wet Metric Tons/ha: 184.00
 Dry Metric Tons/ha: 39.71
 Wet Tons Applied/acre: 82.05

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	1766.95	1576.83	2543.49
NH3	117.06	104.46	155.03
NO3	3.17	2.83	3.69
Organic N	1646.72	1469.53	2384.76
As	0.00	0.00	0.06
Cd	0.04	0.04	0.06
Cr	0.04	0.04	0.76
Cu	14.50	12.94	19.29
Pb	0.00	0.00	0.52
Hg	0.00	0.00	0.01
Mo	0.00	0.00	0.09
Ni	0.10	0.09	0.45
Se	0.37	0.33	0.37
Zn	30.71	27.41	43.29
PAN	391.05	348.97	NA
P	1179.09	1052.22	1705.94

Annual Field Report - 2015

Field Code: ME 3-14
 Date: 2/1/2016
 Total Acres: 91.1
 Tax Assessors Parcel No. 043-100-014
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 71#/acre
 Start Date: 6/17/2015
 Seeding Date: August-15
 Harvesting Date: April-16

Wet Tons Applied: 6335.98
 Dry Tons Applied: 1292.41
 Metric Tons Applied: 5751.80
 Metric Dry Tons Applied: 1173.25
 Wet Metric Tons/ha: 155.97
 Dry Metric Tons/ha: 31.81
 Wet Tons Applied/acre: 69.55

Constituent	Kilograms Applied Year to Date (kg/hc)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/hc)
TKN	1410.58	1258.80	5546.64
NH3	75.64	67.50	279.18
NO3	2.11	1.88	7.19
Organic N	1332.83	1189.42	5260.26
As	0.01	0.01	0.36
Cd	0.02	0.02	0.15
Cr	0.09	0.08	2.35
Cu	8.28	7.39	38.79
Pb	0.06	0.05	2.10
Hg	0.00	0.00	0.05
Mo	0.02	0.02	0.71
Ni	0.08	0.07	1.32
Se	0.17	0.15	0.47
Zn	18.31	16.34	113.31
PAN	306.49	273.51	NA
P	975.95	870.94	2865.57

Annual Field Report - 2015

Field Code: ME 3-16
 Date: 2/1/2016
 Total Acres: 316.6
 043-100-014, 042-100-017
 Tax Assessors Parcel No.
 Crop: Corn+Wheat Hay
 Crop Nitrogen Usage: 425#/acre
 Residual Nitrogen 119#/acre
 Date Started: 9/1/2015
 Seeding Date: December-15
 Harvesting Date: April-16

Wet Tons Applied: 2466.48
 Dry Tons Applied: 836.98
 Metric Tons Applied: 2239.07
 Metric Dry Tons Applied: 759.81
 Wet Metric Tons/ha: 17.47
 Dry Metric Tons/ha: 5.93
 Wet Tons Applied/acre: 7.79

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	275.55	245.90	3099.86
NH3	33.55	29.94	293.79
NO3	0.21	0.19	31.67
Organic N	241.78	215.76	2748.17
As	0.02	0.02	0.76
Cd	0.00	0.00	0.17
Cr	0.19	0.17	4.87
Cu	2.20	1.96	32.09
Pb	0.10	0.09	4.29
Hg	0.00	0.00	0.06
Mo	0.06	0.05	1.08
Ni	0.10	0.09	2.64
Se	0.02	0.02	0.42
Zn	3.96	3.54	91.05
PAN	65.35	58.31	NA
P	179.75	160.41	1632.78

Annual Field Report - 2015

Field Code: ME 3-21
 Date: 2/1/2016
 Total Acres: 33.64
 Tax Assessors Parcel No. 043-100-014
 Crop: Forage Mix
 Crop Nitrogen Usage: 250#/acre
 Residual Nitrogen 0#/acre
 Date Started: 7/1/2015
 Seeding Date: August-15
 Harvesting Date: April-16

Wet Tons Applied: 1055.26
 Dry Tons Applied: 224.24
 Metric Tons Applied: 957.97
 Metric Dry Tons Applied: 203.57
 Wet Metric Tons/ha: 70.35
 Dry Metric Tons/ha: 14.95
 Wet Tons Applied/acre: 31.37

Constituent	Kilograms Applied Year to Date (kg/hc)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/hc)
TKN	559.36	499.17	1446.47
NH3	34.85	31.10	90.48
NO3	1.35	1.20	3.08
Organic N	523.17	466.87	1352.91
As	0.01	0.01	0.21
Cd	0.00	0.00	0.06
Cr	0.08	0.07	0.82
Cu	0.82	0.73	7.68
Pb	0.07	0.06	1.13
Hg	0.00	0.00	0.05
Mo	0.03	0.02	0.24
Ni	0.05	0.05	0.38
Se	0.00	0.00	0.06
Zn	1.46	1.30	21.76
PAN	123.40	110.13	NA
P	493.55	440.45	987.11

Annual Field Report - 2015

Field Code: ME 3-22
 Date: 2/1/2016
 Total Acres: 28.68
 Tax Assessors Parcel No. 043-100-017
 Crop: Forage Mix
 Crop Nitrogen Usage: 250#/acre
 Residual Nitrogen 0#/acre
 Start Date 8/11/2015
 Seeding Date: September-15
 Harvesting Date: April-16

Wet Tons Applied: 1198.76
 Dry Tons Applied: 256.46
 Metric Tons Applied: 1088.23
 Metric Dry Tons Applied: 232.81
 Wet Metric Tons/ha: 93.74
 Dry Metric Tons/ha: 20.05
 Wet Tons Applied/acre: 41.80

Constituent	Kilograms Applied Year to Date (kg/hc)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/hc)
TKN	777.39	693.75	5308.47
NH3	42.55	37.97	366.73
NO3	1.45	1.29	11.11
Organic N	733.39	654.48	4930.63
As	0.01	0.01	1.02
Cd	0.00	0.00	0.29
Cr	0.11	0.09	4.45
Cu	1.45	1.30	48.34
Pb	0.08	0.07	4.02
Hg	0.00	0.00	0.11
Mo	0.04	0.03	1.30
Ni	0.07	0.06	2.65
Se	0.00	0.00	0.62
Zn	2.62	2.34	104.67
PAN	169.40	151.18	NA
P	598.82	534.39	3291.04

Annual Field Report - 2015

Field Code: ME 3-24
 Date: 2/1/2016
 Total Acres: 40.09
 Tax Assessors Parcel No. 043-100-017
 Crop: Forage Mix
 Crop Nitrogen Usage: 250#/acre
 Residual Nitrogen 72#/acre
 Field Start Date: 8/11/2015
 Seeding Date: September-15
 Harvesting Date: April-16

Wet Tons Applied: 1237.74
 Dry Tons Applied: 255.51
 Metric Tons Applied: 1123.62
 Metric Dry Tons Applied: 231.95
 Wet Metric Tons/ha: 69.24
 Dry Metric Tons/ha: 14.29
 Wet Tons Applied/acre: 30.87

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	550.01	490.82	4523.59
NH3	32.23	28.76	296.89
NO3	1.23	1.10	6.24
Organic N	516.55	460.97	4220.46
As	0.01	0.01	0.40
Cd	0.00	0.00	0.28
Cr	0.07	0.07	3.13
Cu	0.77	0.68	31.16
Pb	0.07	0.06	2.94
Hg	0.00	0.00	0.08
Mo	0.03	0.02	0.80
Ni	0.05	0.04	1.72
Se	0.00	0.00	0.27
Zn	1.42	1.27	74.84
PAN	120.65	107.67	NA
P	437.73	390.63	2422.05

Annual Field Report - 2015

Field Code: ME 3-25
 Date: 2/1/2016
 Total Acres: 16.16
 Tax Assessors Parcel No. 043-100-017
 Crop: Forage Mix
 Crop Nitrogen Usage: 250#/acre
 Residual Nitrogen 7#/acre
 Date Started 9/1/2015
 Seeding Date: October-15
 Harvesting Date: March-16

Wet Tons Applied: 798.15
 Dry Tons Applied: 173.95
 Metric Tons Applied: 724.56
 Metric Dry Tons Applied: 157.91
 Wet Metric Tons/ha: 110.76
 Dry Metric Tons/ha: 24.14
 Wet Tons Applied/acre: 49.39

Constituent	Kilograms Applied Year to Date (kg/hc)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/hc)
TKN	1023.14	913.05	3065.16
NH3	33.50	29.89	154.99
NO3	1.21	1.08	3.33
Organic N	988.43	882.08	2906.84
As	0.06	0.06	0.47
Cd	0.04	0.03	0.21
Cr	0.57	0.51	2.75
Cu	8.35	7.45	34.12
Pb	0.47	0.42	2.83
Hg	0.01	0.01	0.08
Mo	0.21	0.18	0.92
Ni	0.32	0.28	1.36
Se	0.00	0.00	0.23
Zn	21.57	19.25	83.20
PAN	215.65	192.45	NA
P	720.94	643.37	1862.17

Annual Field Report - 2015

Field Code: ME 3-26
 Date: 2/1/2016
 Total Acres: 18.88
 Tax Assessors Parcel No. 043-100-017
 Crop: Forage Mix
 Crop Nitrogen Usage: 250#/acre
 Residual Nitrogen 148#/acre
 Date Started: 8/24/2015
 Seeding Date: September-15
 Harvesting Date: April-16

Wet Tons Applied: 350.29
 Dry Tons Applied: 74.43
 Metric Tons Applied: 317.99
 Metric Dry Tons Applied: 67.57
 Wet Metric Tons/ha: 41.61
 Dry Metric Tons/ha: 8.84
 Wet Tons Applied/acre: 18.55

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	330.44	294.89	4617.29
NH3	20.59	18.37	276.04
NO3	0.80	0.71	4.57
Organic N	309.06	275.81	4336.68
As	0.00	0.00	0.37
Cd	0.00	0.00	0.16
Cr	0.05	0.04	3.62
Cu	0.48	0.43	31.74
Pb	0.04	0.04	2.95
Hg	0.00	0.00	0.03
Mo	0.02	0.01	0.67
Ni	0.03	0.03	2.06
Se	0.00	0.00	0.10
Zn	0.86	0.77	69.04
PAN	72.90	65.06	NA
P	262.56	234.31	2433.11

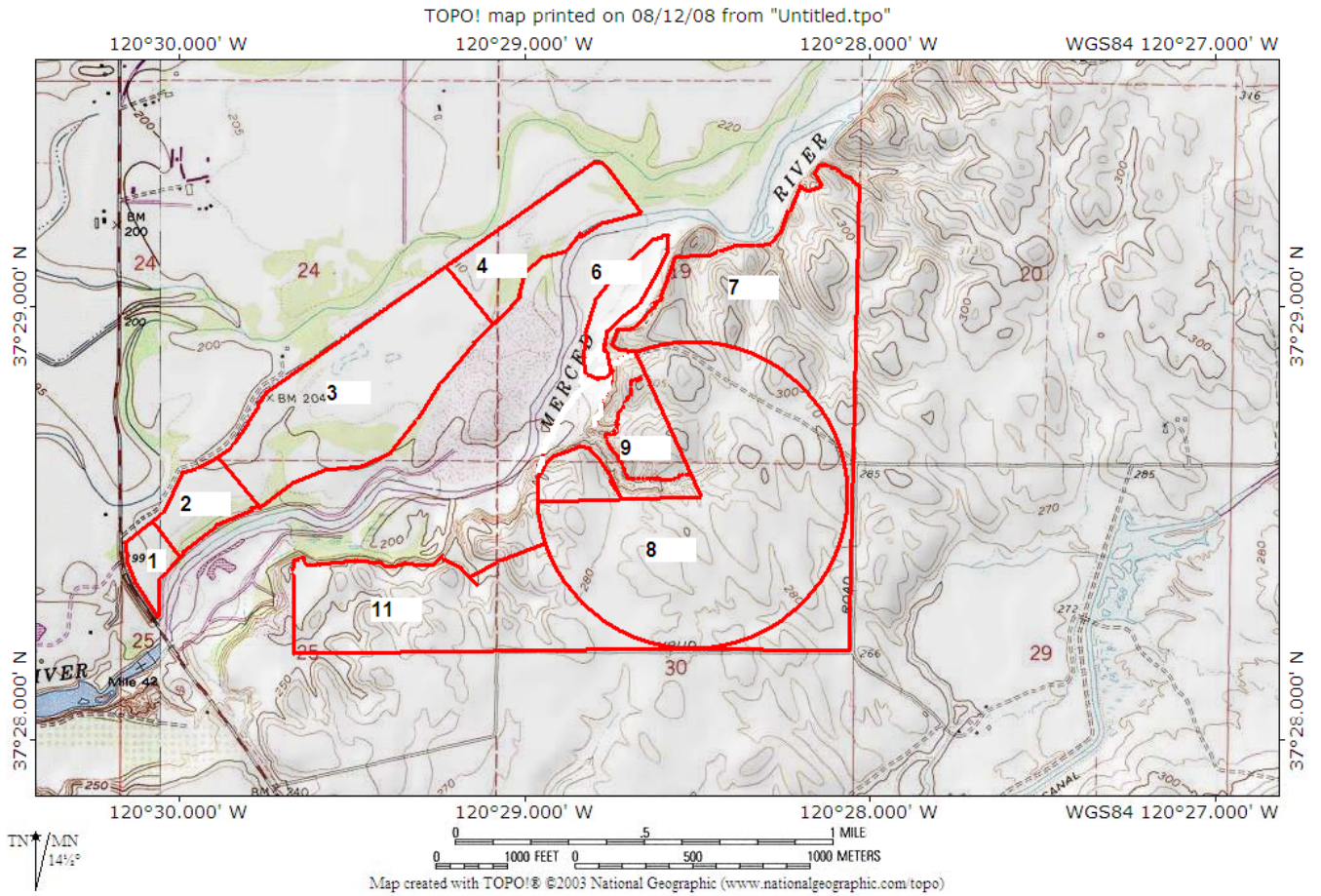
Annual Field Report - 2015

Field Code: ME 3-28
 Date: 2/1/2016
 Total Acres: 56.12
 Tax Assessors Parcel No. 043-100-017
 Crop: Forage Mix
 Crop Nitrogen Usage: 250#/acre
 Residual Nitrogen 150#/acre
 Date Started: 8/24/2015
 Seeding Date: September-15
 Harvesting Date: April-16

Wet Tons Applied: 1125.77
 Dry Tons Applied: 240.54
 Metric Tons Applied: 1021.97
 Metric Dry Tons Applied: 218.36
 Wet Metric Tons/ha: 44.99
 Dry Metric Tons/ha: 9.61
 Wet Tons Applied/acre: 20.06

Constituent	Kilograms Applied Year to Date (kg/ha)	Pounds Applied Year to Date (lbs/ac)	Kilograms Applied Project to Date (kg/ha)
TKN	370.17	330.34	4730.26
NH3	20.76	18.53	204.39
NO3	0.73	0.65	4.58
Organic N	348.68	311.17	4521.28
As	0.01	0.00	0.36
Cd	0.00	0.00	0.18
Cr	0.05	0.05	3.37
Cu	0.66	0.59	30.91
Pb	0.04	0.04	3.95
Hg	0.00	0.00	0.03
Mo	0.02	0.02	0.70
Ni	0.03	0.03	1.80
Se	0.00	0.00	0.11
Zn	1.20	1.07	70.96
PAN	80.84	72.14	NA
P	286.74	255.89	2155.62

Field Maps

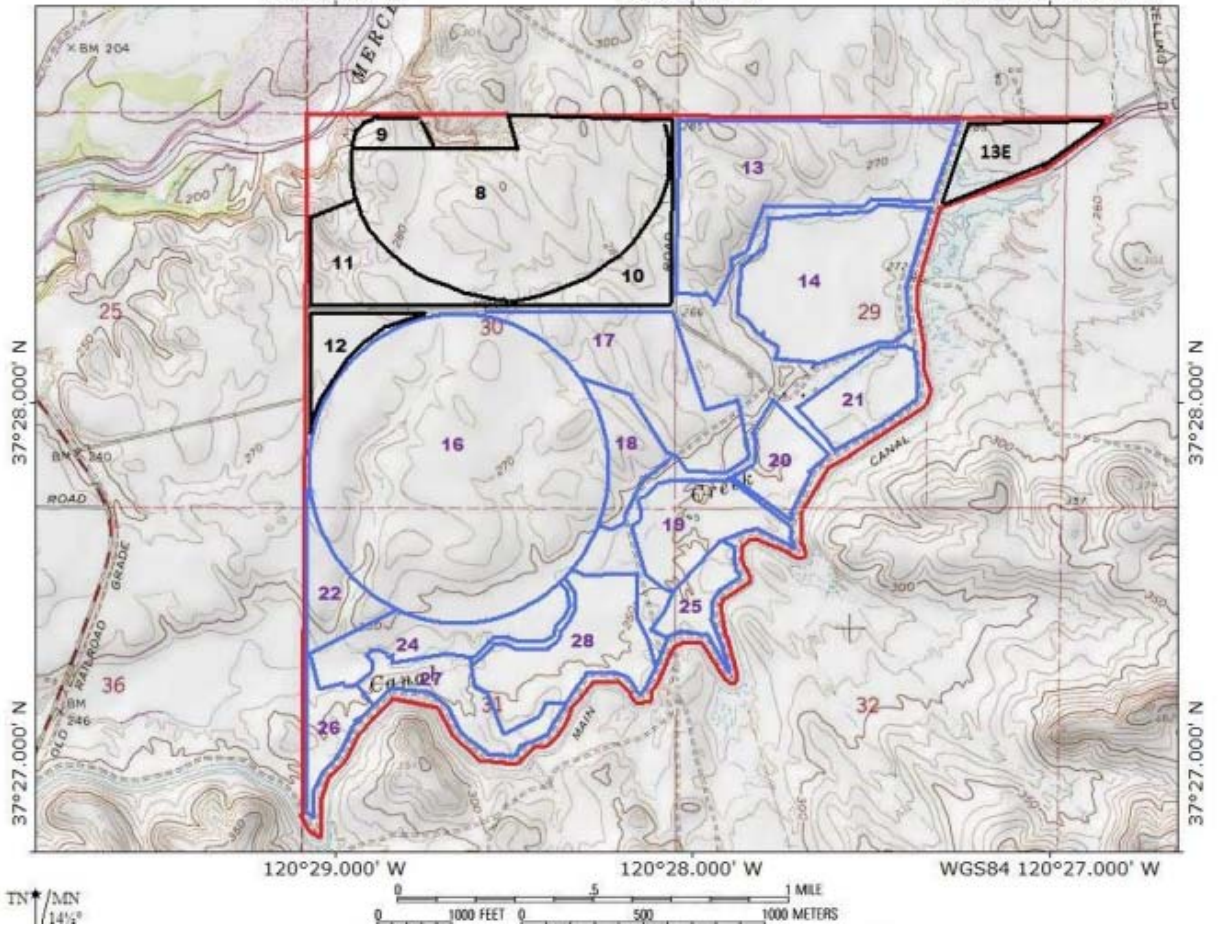


TOPO! map printed on 06/17/10 from "Untitled.tpo"

120°29.000' W

120°28.000' W

WGS84 120°27.000' W



Certification Statement

Solid Solutions

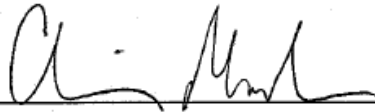
A Denali Water Solutions company
12812 Valley View Street, Suite 9
Garden Grove, CA 92845

Merced County, California Biosolids Land Application 2015

Certification Statement

"I certify under penalty of law that the information used to determine compliance with the management practices in 503.14, the general requirement in 503.12, and the site restrictions in 503.32(b)(5) was prepared under direction and supervision in accordance with the system designed to ensure that qualified personnel gather and evaluate this information. I am aware that there are significant penalties for false certification including the possibility of fine and imprisonment."

By: _____



Date: _____

