COUNCIL AGENDA: AUGUST 5, 2014

SUBJECT: AUTHORIZATION TO ADVERTISE FOR BIDS - RECLAMATION AREA LEASE

SOURCE: Public Works Department – Field Services Division

COMMENT: The City of Porterville's current Reclamation Area Lease is scheduled to expire on October 31, 2014. Staff is requesting authorization to advertise for experienced farming entities for the Reclamation Area Lease. Prospective farming entities are invited to propose a fee per Assessor's Parcel Number (APN) acreage to be paid to the City.

The City operates a reclamation enterprise for disposing of secondary treated effluent and biosolids generated from the wastewater treatment facility. Effluent is delivered to the reclamation area 24 hours/day, 7days/week at varying rates. Typically, 4.4 million gallons of effluent are produced per day, but may peak at 5.0 million gallons per day.

Approximately 1,100 metric tons of biosolids are applied annually as a soil amendment to the reclamation area. Lessee will be required to maintain and operate the non-crop and percolation pond components of the Reclamation Area. All activities are under the supervision of the City, and disposal program objectives are the priority. Staff wants to highlight the following points regarding the RFP:

1. In the event of an emergency, the City reserves the right to flood or otherwise increase effluent flow to acreage under cultivation. The risk and associated damage to cultivated acreage shall be borne by the lessee.

2. The RFP shall be advertised and the farmer selected under "professional services" criteria. The bid proposal cost will not be the sole factor when evaluating the entire proposal. Other factors that will be considered include:

    a) Farming business experience, financial condition of applicant (25%);

    b) Marketing & Sales experience per crop (5%);

    c) Proposed annual lease per APN acre (40%); and

Dir _____ Appropriated/Funded _____ CM _____ Item No. 7

d) Other factors such as, but not limited to, recycled water irrigation and biosolids application experience, quality of existing farming operations and response to the RFP (30%).

3. The successful farmer will be required (at their cost) to accept and spread biosolids on selected fields per the City's Biosolids Management Plan.

4. The lease agreement shall be for a 5-year period. There is no automatic or mutually agreed upon 5-year extension in this contract. A "90-day notice of termination" clause consistent with Section 68 of the Municipal Code is included in the Lease Agreement language.

A project schedule is included in the Request for Proposals and is as follows:

1.	August 6, 2014	RFP available to public
2.	August 25-29, 2014	Pre-proposal site tour
3.	September 4, 2014	Proposals due
4.	September 16, 2014	Lease agreement awarded
5.	October 31, 2014	Current lease agreement terminates
6.	November 1, 2014	Lease agreement begins

RECOMMENDATION: That the City Council:

1. Review staff's report along with the entire Reclamation Area Lease "Request for Proposal," and add, delete or otherwise modify if necessary said proposal;

2. Direct the Public Works Director to update the "Request for Proposal" to include Council's comments;

3. Authorize the Public Works Director to advertise the "Request for Proposals for Reclamation Area Lease;" and

4. Direct the Public Works Director to present a recommendation for awarding the lease agreement on September 16, 2014.

ATTACHMENT: Reclamation Area Lease Request for Proposal

CITY OF PORTERVILLE

2014

RECLAMATION AREA LEASE

REQUEST FOR PROPOSAL

(RFP)

CITY OF PORTERVILLE
WASTE WATER TREATMENT PLANT
Reclamation Area LEASE – REQUEST FOR PROPOSAL

I. SUMMARY

The City of Porterville is soliciting bids from experienced farming entities for the Lease of the City Reclamation Area. Prospective farming entities are invited to propose a Farmland Lease expressed as a fee per Assessor's Parcel Number (APN) acreage to be paid to the City of Porterville. The Lease is based on APN acreage not the United States Department of Agriculture (USDA) cropping map. The Lessee will be entitled to the following:

a) Recycled wastewater as delivered by the City to the Reclamation Area for Irrigation;
b) Ownership of all crops;
c) Value of Crops used by Lessee for his/her own use;
d) All government subsidies; and
e) All revenue from whatever source received in connection with the planting or withholding the planting of crops on the subject property.

As part of the Lease, the Lessee will be required to maintain and operate the non-crop and percolation pond components of the Reclamation Area. All activities are under the supervision of the City and disposal program objectives are the priority. The farming entity that is awarded the Lease will be directed by City to complete activities as needed. It is recommended that prospective bidders become familiar with the regulatory requirements prior to preparing the bid documents (see attachments).

II. BACKGROUND

The City of Porterville operates a reclamation enterprise for disposing of secondary treated effluent from the wastewater treatment facility. Typically at rate of approximately 4.4 million gallons per day but may be up to 5.0 million gallons per day, or 15acre-feet, per day of treated effluent. The system delivers wastewater to the reclamation area 24 hours per day, 7 days per week. Approximately 1,100 metric tons of biosolids are also delivered to the reclamation area annually which are used as a soil amendment. The method of disposal consists of different operations:

- Farming
- Percolation Ponds
- Biosolids Application

The primary method of disposal for the effluent is the irrigation of approximately 594.62 acres of leveled farmland, as determined from the March 2011 USDA cropping map. The City does not guarantee the total acreage leveled for farming or the condition of soil. The lessee is responsible for an annual soil analysis that measures the level of nutrients in the soil. The analysis is used to assess the fertility of the soil and to determine ways to increase fertility levels at Lessee's expense. It is the proposers responsibility to inspect the reclamation area between August 25, 2014, through August 29, 2014, and to review the RFP before submitting the $/APN acre lease bid.

Effluent from the Wastewater Treatment Facility is delivered to the reclamation area through a City owned pipe system, and then applied through conventional flood irrigation systems. Up to 50% of the treated effluent may be discharged to percolation ponds located at the reclamation area. If the lessee uses the percolation ponds for winter crop, the lessee runs the risk of losing the crop if the percolation ponds are needed for the winter storage of effluent. Biosolids are dried and stockpiled at the airport solar drying beds. Lessee is responsible for the loading and transporting of biosolids to fields receiving biosolids per 5-year Biosolids Management Plan (BMP). The biosolids will be broadcasted on fields during field preparation for alfalfa at lessee's expense. The nitrogen from irrigation and biosolids application must be balanced to meet agronomic rates.

The choice of crops and rate of effluent and biosolids application has been predetermined by the 2010 5-year Biosolids Management Plan (BMP), Waste Discharge Requirements (WDR) R5-2008-0034 and Water Reclamation Requirements (WRR) 5-01-246 as mandated by the Regional Water Quality Control Board (RWQCB) using APN acreage. The 2010 BMP is in its last year and a new 5-year BMP should be completed in October 2014. These documents direct all activities at the reclamation area, whether it is wastewater application or other customary farming practices such as the application of biosolids, soil amendments, fertilizers, pesticides, and herbicides. The RWQCB has directed the City to dispose of its effluent in an environmentally sound manner that minimizes groundwater degradation to the area and does not adversely affect the Teapot Dome Landfill. The Department of Health Services regulations (California Title 22, Article 3, and Section 60304) allow irrigation of fodder and fiber crops with secondary-treated recycled water. Currently, the program rotates alfalfa, Sudan grass, wheat and oat hay.

First and foremost, the City is committed to program development that prioritizes the changing needs of a growing community, minimizes taxpayer cost, and maximizes effective disposal of effluent. The Reclamation Area program can therefore be expected to change as development requires. Whereas all of the situations that may develop cannot be anticipated, it is recognized that compliance and changing disposal needs will necessitate close coordination between all involved parties. The City and Lessee must operate knowing that there are unknown future developments that will likely affect the program.

III. ELEMENTS OF RECLAMATION AREA LEASE AGREEMENT

The Lessee will have specific obligations as part of the Farmland Lease. The Reclamation area is operated in three components: Farming, Non-Crop, and Percolation Ponds. The Lessee agrees to operate the entire property in order to maximize discharge of effluent according to all applicable regulations and the City's discharge requirements.

The applicant must submit a bid for all of the properties included in the program. The Lessee is responsible for water management, irrigation, farming and operations of the crop land while *irrigation infrastructure and capital projects are budget items and are paid by the City.* The Lessee is responsible for all utility expenses as described in Section 10.1 and 10.2 of the Reclamation Area Lease Agreement.

Operation of the property is to comply with all federal, state, and local regulations including, but not limited to, waste discharge requirements and plans concerning management of the reclamation area and the San Joaquin Valley Air Pollution Control District Rule 8 (agricultural sources). The Lessee shall comply with all requirements of regulatory agencies, the collection and compilation of data and reporting for these agencies and for enrollment in the USDA farming programs. The Lessee must maintain general liability insurance with a minimum of $2 million in coverage. The Lessee is responsible for the harvesting and marketing of all crops.

1. SUMMARY OF RECLAMATION AREA LEASE:

A) Right to Farming Activities and Limited Right to Wastewater: All direct farming operations for the establishment, husbandry, harvest, storage, and sale of crops.

B) Obligation to Fulfill Non-Crop Activities: Maintenance and adherence to all requirements of regulatory agencies for property outside direct crop land. Operate the delivery system, i.e. provide water to other property owners as directed by the City.

C) Obligation to Operate and Maintain Percolation Pond: Maintenance and adherence to all requirements of regulatory agencies for percolation pond system.

The mission of this program is the disposal of reclaimed water. If the challenges of managing a constant flow of effluent through irrigation or emergency water management practices either deleteriously affect or even ruin crop yields, there is no additional compensation for the farm Lessee. Crop insurance, pre- and post-harvest, if available, is the responsibility of the Lessee.

Compliance & Reporting
The Lessee agrees to operate the property in order to maximize irrigation with effluent according to all applicable regulations and discharge requirements. Operation and Lease of the property is to comply with all federal, state, and local regulations including, but not limited to, waste discharge and biosolids utilization requirements, and plans concerning Lease of the reclamation area and the San Joaquin Valley Air Pollution Control District Rule 8 (agricultural sources).

2. CONTRACTUAL RESPONSIBILITIES

The Reclamation Area Lease Agreement consists of three components: Farming Activities, Non-crop activities, and Percolation Pond Operation / Maintenance. The contractual duties are summarized below:

A) Farming Activities: All direct farming operations for the establishment, husbandry, harvest, storage, and sale of crops; use and management of all irrigation water, whether delivered to a field in the Reclamation Area or to outside water users. At no time shall the entire system of valves be closed at once, as the lessee must dispose of all water delivered to the Reclamation Area daily.

B) Non-Crop Activities: Maintenance and adherence to all requirements of regulatory agencies for property outside direct crop land. Weed abatement and rodent control in all

acreage defined in Agreement as Non-Crop areas. Operate the delivery system, i.e. provide water to other property owners as directed by the City.

C) Percolation Pond: Maintenance and adherence to all requirements of regulatory agencies for percolation pond system.

IV. DESCRIPTION OF RECLAMATION AREA

1) See Attachment for property map and locations.

2) Program Specifics
The following outlines the responsibilities for each component of the operation. Also see attached Reclamation Area Lease Agreement.

A) **Farming Activities**:

a) Field Lease including field preparation, furrowing, seed bed preparation, herbicide application and weeding or abatement, planting, and cultivation;

b) General Crops including irrigation, pest control, nutrient use;

c) Harvesting, including inventory and sales;

d) Assist in preparation of RWQCB reports & documentation, compliance with all regulatory reporting;

e) Emergency water management as needed;

f) Operate and maintain all well, return pumps and irrigation facilities; and

g) Compilation of data and assistance for enrollment in all government programs.

B) **Non-crop Activities**:

a) Maintenance of non-crop areas, including, but not limited to, roadways, roadsides, drainage ditches, irrigation channels, levee banks, fence lines, vacant acreage, pumps, tail water ponds, water control structures, hay storage areas, miscellaneous structures;

b) Non-crop weed abatement;

c) Limited capital projects – minor pipeline repair and installation, land planning, and culvert maintenance. There may also be included pre-determined Capital Projects to be undertaken where Reclamation Area

Lessee may provide custom farm work and be compensated under the terms of agreement for specific items;

d) Application of biosolids, gypsum and soil amendments; and

e) Soil testing and reporting.

C) **Percolation Pond**

a) Distribution of effluent to and within percolation ponds;

b) Maintain ponds against erosion, rodent damage;

c) Periodic disking, clearing, or other maintenance as directed by the City to maintain infiltration rates;

d) Weed abatement adjacent to and including within pond areas;

e) Maintenance of existing pipeline, valves, meters, overflows and other percolation pond infrastructure and levees; and

f) Emergency water release as needed.

3) Requirements of Reclamation Area Lessee

1. Provide proof of general liability insurance, minimum of $2 million overall coverage.
2. Provide proof of Workers' Compensation coverage.
3. Compliance with all requirements of regulatory agencies, including labor laws.
4. Lessee complies with the principles of Best Management Practices:

Best Management Practices

The list of general principles which define BMPs follows:

- Set accomplishable, realistic, and measurable economic and environmental objectives, using annual budget and cropping plans.
- Know and understand economic, environmental, and agronomic processes involved.
- Timely and uniformly apply water and nutrients as needed.
- Evaluate results and amend implementation plan for next cycle.

BMPs for this project may include, but are not limited to:

- No use of nitrogen fertilizers without prior approval from the City.
- No discharge of recycled water or run off beyond the boundaries of the contracted parcel.
- Maintenance of the premises in an orderly and clean condition.

- Avoidance or reduction of irrigation during rain events.
- Application of soil amendments at agronomic rates per biosolids application plan.

V. PROJECT TIME SCHEDULE

1. August 6, 2014 RFP Available to Public
2. August 25-29, 2014 Site Tour
3. September 4, 2014 Proposals Due
4. September 16, 2014 Lease Contract Awarded
5. October 31, 2014 Current contract terminates
6. November 1, 2014 Lease Contract begins

VI. INSPECTION OF PREMISES

An inspection of the premises for all applicants submitting proposals will be from August 25, 2014, through August 29, 2014.

VII. QUALIFICATIONS AND SELECTION CRITERIA

The City policy for awarding this Reclamation Area Lease Agreement will be based on the most qualified applicant as determined by the City, not necessarily the applicant who submits the highest bid. The City will carefully investigate each applicant's background and experience in farming operations. The City recognizes its policy of providing equal opportunity to all qualified persons and reaffirms its commitment that there shall be no discrimination against qualified applicants on the basis of race, gender, color, national origin, religion, age or disability.

The applicant must have experience in managing farming operations of similar or greater size. The proposing farming entities will also make their existing farming operations available for review and inspection by City staff and consultants. Proposal selection will be based on the criteria shown on the following table:

PROPOSAL SELECTION CRITERIA AND WEIGHTING

Criteria	Points
1. Farming business experience, financial condition of the applicant	**25**
2. Marketing & sales experience for crops	**5**
3. Proposed annual lease ($/APN acre)	**40**
4. Recycled water irrigation and biosolids application experience, quality of existing farming operations and response to RFP	**30**
Total items 1-4	**100**

VIII. FORMAT OF THE PROPOSAL RESPONSE

See Attachment, Bid Proposal and application. Please return proposal and application by September 4, 2014, 4:00 pm, to:

City of Porterville
Attn: Director of Public Works
Re: Reclamation Area RFP
291 Main Street
Porterville, CA 93257

1. Required Bid Conditions – signature page
2. Summary of Experience
3. Financial Credit References
4. Authority to Release Information and Hold Harmless
5. Proof of General Liability and Workers' Compensation Coverage
6. Bid for Annual Reclamation Area Lease

The proposal should be brief and complete. Submittal of the attached forms is required and considered sufficient for the response to this RFP. However, applicants may include additional information as deemed necessary.

The proposal must be for the entire length of Reclamation Area Lease Agreement (5-years).

IX. GENERAL ATTACHMENTS

9. Bid Proposal and Application (to be returned to the City)
10. Reclamation Area Lease Agreement
11. Crop Plan, 5-year
12. Copy of General Order, Biosolids Utilization
13. Copy of Water Reclamation Requirements WRR 5-01-246 as adopted 19 OCT 2001
14. Map of Reclamation Area
15. Soil Analysis
16. Soil Amendment Additions

X. GLOSSARY OF TERMS

Biosolids - Sewage sludge, dry solids, same as sludge
WDR - Waste Discharge Requirements R5-2008-0034
WRR - Water Reclamation Requirements WRR –01-246
WWTF - Wastewater Treatment Facility
Recycled Wastewater - Same as effluent
CVRWQCB - Central Valley Regional Water Quality Control Board
Treated Wastewater - WWTF effluent, containing nitrogen as fertilizer
Premises - Interchangeable with Reclamation Area

1. Bid Proposal and Application

(to be returned to the City)

CITY OF PORTERVILLE - WASTE WATER TREATMENT FACILITY
Bid Forms for Reclamation Area Lease

NAME: _____ DATE: _____

1. REQUIRED BID CONDITIONS – signature page

For the Bid on the Reclamation Area Lease, City of Porterville, Wastewater Treatment Facility Reclamation Area and Farmland

Name of Applicant: _____
Business Address: _____
City and Zip: _____
Place of Residence: _____
Telephone: Office: _____ Mobile: _____

The Premises referred to herein is to be operated in accordance with the agreement summary and the provisions and specifications contained therein and be referenced thereto made a part hereof. In the event I am the successful bidder, I will diligently farm all land available for irrigation and follow all specifications of the Lease Contract.

The undersigned, as proposer, declares that the only person or persons interested in the proposal as principals, are those names herein; that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the locations of the Reclamation Area acreage, Federal, State, County and City laws relating to farming operations upon the Reclamation Area Lease , the term, conditions, specifications and other stipulations hereinbefore or hereinafter set out and the Reclamation Area Lease attached hereto.

If this proposal is accepted, said undersigned applicant shall execute a Reclamation Area Lease. If the undersigned shall fail to execute such a agreement within five (5) days after the applicant has received notice from the City or its duly authorized representative that the agreement is ready for signature, the City may determine that the applicant has abandoned the agreement; and thereupon this proposal and the acceptance thereof shall be null and void, and of no force and effect.

IMPORTANT NOTICE
If the proposer is a corporation, state legal name of corporation, address, state of incorporation, person designated for service of process, also names of directors, president, secretary, treasurer and manager thereof; If co-partnership, state true name of firm, also names of individual co-partners comprising the firm; if bidder is an individual, state first, middle, and last name in full.

_____
_____
_____
_____

Dated: _____ Signature of Applicant: _____

NAME: _____ DATE: _____

2. SUMMARY OF EXPERIENCE

(Use additional paper/attachments as needed)

1. **Describe your current farming operations, experience with irrigated crops, including amount of land owned or leased, length of existing operations, and other relevant details regarding your existing operation.**

2. **Describe the expected challenges associated with your current understanding of the Reclamation Area Lease, and how you are prepared to address them.**

3. **Describe your experience with irrigation using recycled water and/ or the application of biosolids**

NAME: _____ DATE: _____

4. **Describe the agronomic challenges regarding the composition of the recycled water, the constant flow of water, and mitigation techniques.**

5. **Describe the existing and future markets for the crops that will be produced. Provide an estimated crop yield per acre per year and your intended sales plan.**

6. **Describe required operations and suggested activity schedule for the crops currently grown at the City Reclamation Area: Alfalfa, Oats, Wheat, and Sudan Grass. (Oats or Wheat is double cropped in the same year as 1st year Alfalfa.)**

NAME: _____ DATE: _____

NAME: _____ DATE: _____

3. FINANCIAL and CREDIT REFERENCES

Please include Bank Reference and three (3) credit references with regard to your current or past farming activities:

BANK REFERENCE
Name: _____

Contact: _____

Address: _____

_____

Phone: _____

Acct Name and Number: _____

CREDIT REFERENCES
1) Name: _____

Contact: _____

Address: _____

Phone: _____

Acct Name and Number: _____

1) Name: _____

Contact: _____

Address: _____

Phone: _____

Acct Name and Number: _____

1) Name: _____

Contact: _____

Address: _____

Phone: _____

Acct Name and Number: _____

NAME: _____ DATE: _____

4. AUTHORITY TO RELEASE INFORMATION AND HOLD HARMLESS

TO Whom It May Concern:

It is my understanding that in connection with the proposal for the Reclamation Area Lease Agreement of the Wastewater Treatment Plant of the City of Porterville, I am required to furnish information for a thorough background and credit investigation to determine my qualifications. Based on that understanding, I hereby authorize the release of any and all information that you may have concerning me, including, but not limited to information of a confidential or privileged nature, or any data or materials which have been sealed or agreed to be withheld pursuant to any prior agreement or court proceeding involving disciplinary matters, upon the request of any agent of the agreement or court proceeding involving disciplinary matters, upon the request of any agent of the City of Porterville bearing this release or a copy thereof within twelve (12) months of the date signed.

I understand that I will not receive and am not entitled to know the contents of confidential reports received, and I further understand that these reports are privileged.

I hereby release, discharge and exonerate the City of Porterville, its officer, agents, employees, representatives and any person or organization furnishing information, from any all liability of every nature and kind arising out of the furnishing and inspection of such documents, records and other information, and this release shall be binding on my legal representative, heirs and assigns.

Failure to comply with this request may adversely affect my potential for entering into a Reclamation Area Lease with the City of Porterville. Should there be any question as to the validity of this release, you may contact me as indicated below.

_____

Signature

_____

Name

_____

Current Address

_____

Home Phone **Business Phone**

_____

Witness **Date**

NAME: _____ DATE: _____

5. PROOF OF GENERAL LIABILITY, WITH CITY OF PORTERVILLE DESIGNATED AS "ADDITIONAL INSURED"

Please attach proof of insurance and contact information.

6. BID FOR LEASE of RECLAMATION AREA

Bid lease is based on Reclamation Area Assessor's Parcel Number (APN) acres. Total APN acres of Reclamation Area are 682.40.

$_____(per APN acre) x 682.40 (acres) = $_____ Annual lease bid

x 5 (years) = $_____ Total lease bid

Additional information

_____
_____
_____
_____
_____

Signed

_____

Name (Please Print)_____

Date _____

2. Reclamation Area Lease Agreement

City of Porterville Reclamation Area Lease Agreement
Porterville, CA

(City of Porterville - _____, Lessee)

THIS AGREEMENT, is executed in Porterville, California, on November 1, 2014, (herein after "Execution Date") by and between the City OF PORTERVILLE, (hereinafter "Lessor"), and _____, (hereinafter "Lessee").

WITNESSETH:

WHEREAS:

1. THE CITY Reclamation Area Lease Agreement and ensuing amendments thereto expire October 31, 2019.
2. THE CITY Reclamation Area Lease Agreement and ensuing amendments thereto allowed parties to farm Reclamation Area property for the specific purpose of dispersing effluent from THE CITY wastewater operations to irrigate crops not used for human consumption; and
3. Lessee has acknowledged it is capable of such farming and operational management of the Reclamation Area, and dispersion of effluent on the City land; or contracted land.
4. THE CITY desires to contract with Lessee for these purposes.

NOW, THEREFORE, IT IS MUTUALLY AGREED as follows:

1. Premises
   1.1. The Premises is defined as the area leased to Lessee for the purposes of this Agreement and further described in Provisions herein below.
   1.2. As of January 1, 2014 the Premises is described as "The Reclamation Area" on Exhibit A and includes:
      1.2.1. Parcel 1: APN 302080011 Airport
      1.2.2. Parcel 2: APN 302110059 City Lease Purchase East
      1.2.3. Parcel 3: APN 302100015 City Lease Purchase West
      1.2.4. Parcel 4: APN 302130028 City
      1.2.5. Parcel 5: APN 302130008 Underhill West
      1.2.6. Parcel 6: APN 302130007 Underhill East
      1.2.7. Parcel 7: APN 302130019 Hunsaker West
      1.2.8. Parcel 8: APN 302130021 Hunsaker East
   1.3. For operational purposes, Exhibit B divides the Premises into portions identified as Field Numbers 5N; 5S; 7; 8; 9; 10; 27; 28; 29; 30; 31; 32; 33; 34; 35; 46; 160A, B, C, & D;
   1.4. Exhibit A and B are attached hereto and by this reference incorporated herein.
   1.5. The City makes no covenants or warranties regarding the condition of the Premises, the soils thereon, the effluent, or the improvements and appurtenances thereto.
      1.5.1. Inspection of the Premises will be made available from August 25, 2014 through August 29, 2014 to those submitting proposals.
      1.5.2. The most recent soil analysis will be made available on August 25, 2014.

1.6. Lessee has inspected the Premises and improvements thereon, knows the extent and condition thereof, and accepts same in their present condition, including all defects, latent and/or patent.

1.7. The City shall have the right to reduce or expand the acreage of the Premises and remove or add to this area for Lessee's use.

1.7.1. At least 90 days prior to reduction or enlargement of the lease area, the City shall provide Lessee written notice stating:

1.7.1.1. The effective date of the reduced or enlarged area.

1.7.1.2. A description and drawing that identify the reduced or enlarged area and remaining lease area.

1.7.1.3. A revised rental rate to begin the effective date.

1.7.1.4. A request to meet with Lessee to provide additional information.

1.7.2. Lessee shall have 60 days from the date of the City's written notice to terminate this Agreement by providing written notice to the City and if so terminated:

1.7.2.1. Lessee's date of termination shall be the same as the effective date.

1.7.2.2. Lessee shall have the right to harvest existing crops within the Premises through the 90 day to the effective date of the notice to terminate.

1.7.2.3. Lessee shall be required to pay the rent due within the 90 day period in the manner described in Paragraph 5 herein below, but said payment shall be pro-rated for the number of days after that last rent payment (either July 1st or January 1st) to the effective date of termination.

1.7.2.4. Upon such early termination, the City shall pay to Lessee, or credit Lessee's last rent payment, the market value of any improvements made or put upon said premises by the Lessee in accordance with Section 68 of the City Charter.

2. Off-Premises and Easement Areas

2.1. Lessee is responsible for delivering effluent to property outside of the Reclamation Area (Off-Premises), in accordance with the City's existing and future agreements with other parties.

2.2. Lessor shall also permit Lessee the non-exclusive right to use existing roads on Section lines and quarter Section lines on the Premises.

2.2.1. Lessor and Lessor's easement holders and invitees may also use said roads for vehicular traffic.

2.2.2. Lessee shall not remove said roads and shall keep said roads open and maintained to allow two-wheel drive travel.

2.3. Lessee is aware that various easements cross the Premises and that from time to time easement holders have the right to enter the Premises, conduct their operations, and may temporarily hinder Lessee's operations.

2.4. Lessee has inspected the farm connection road, dirt roads, easement areas, and other off-Premises areas that Lessee may use or benefit from, knows the extent and condition thereof, and accepts same in their present condition, including all defects, latent and /or patent.

3. Purpose

3.1 The purpose of this Agreement is for Lessee to reuse and disperse the wastewater from the City exclusively on the Premises in order to irrigate and farm the Premises.

3.1.1 The City effluent is controlled by the California Region Water Quality Control Board (CRWQCB) Waste Discharge Requirements (R5-2008-0034).

3.1.2 Lessee shall not farm or grow crops to be used for human consumption.
3.1.3 No grazing of dairy cows shall be permitted on the Premises.
3.2 Lessee shall not use the Premises or effluent for any other purposes, except as provided elsewhere in this Agreement.

4. Term
4.1. The term hereof shall commence on November 1, 2014 and terminate on October 31, 2019.
4.2. The Lease shall be for five (5) years.
4.3. Early termination of the Agreement may be instituted by:
4.3.1. Lessee, by providing to the City written notice at least 90 days prior to the new date of termination.
4.3.1.1. In such case Lessee shall pay to the City rent for the remaining 90 days.
4.3.1.2. Lessee shall continue to farm and disperse effluent and abide by the terms as stated in this Agreement through the noticed date of termination.
4.3.2. The City, by providing to Lessee written notice 30 days prior to the new date of termination if:
4.3.2.1. Lessee has demonstrated reckless or dangerous operations on the Premises and has not corrected those operations immediately upon written notice by the City, or.
4.3.2.2. Lessee assigns or sublets any portion of the Premises without written permission by the City.
4.3.3. The City, by providing to Lessee written notice at least 90 days prior to the new date of termination.
4.3.3.1. Upon such early termination, the City shall pay to Lessee, or credit Lessee's last rent payment, the market value of any improvements made or put upon said premises by the Lessee in accordance with Section 68 of the City Charter.
4.3.3.2. After the new termination date described in the 90 day notice, Lessee understands that the City will not be required to recompense Lessee for any losses of income or damages incurred by Lessee in such instance.
4.3.4. Mutual written agreement of both parties.

5. Rent and Payment Requirements
5.1. Beginning November 1, 2014, Lessee shall pay to the City, in lawful money of the United States, an annual rental in the amount of _____ ($/acre) for Lessee's use of the Premises and effluent water.
5.1.1. At least fifty percent (50%) of the annual rental amount shall be paid prior to October 31 of each year with first payment due November 30, 2014.
5.1.2. The remainder of the annual rent, to equal 100%, shall be paid prior to March 31 of each year.
5.1.3. Payments later than 10/31 and 3/31, respectively, shall be assessed a late fee of one half of one percent (.005 time 50% of the annual rent) per day through the day the required payment is made.
5.2. Rent shall be paid by check made out to City of Porterville and mailed or delivered in person to the City of Porterville, 291 Main Street, Porterville, CA 93257.

5.3. As security for this Lease, Lessee must provide an Irrevocable Letter of Credit, equal to 6 months rent, as shown on Exhibit C which is attached hereto and by this reference incorporated.

5.4. The cost of work or improvements done by Lessee outside the scope of Paragraph 8, may only be deducted from the next scheduled payment if:

5.4.1. The work is performed at the request of the City;

5.4.2. The City has given prior written approval to a written estimate provided by Lessee for the not to exceed cost of work or improvements; and

5.4.3. Upon completion of the work or improvements, Lessee provides the City with an invoice of the final actual cost amounts, including units and cost per unit as appropriate.

6. Operations

6.1. Lessee shall conduct all operations according to good farm husbandry practices.

6.2. Lessee shall manage operations in compliance with all applicable federal, state, and county laws, regulations and ordinances, including local water board discharge requirements and the local air district rules.

6.3. Lessee shall conduct operations in a business-like manner and not harm or degrade the City and its operations.

6.4. Lessee shall not do or permit any act or thing that constitutes a nuisance by the City either on or off the Premises.

6.4.1. Lessee shall take immediate action to correct any such nuisance discovered by Lessee or through notification by the City within three (3) days of discovery or notification.

6.4.2. Lessee shall promptly perform the correction efforts in a manner to prevent its reoccurrence.

6.5. Each year, upon notification by the City, Lessee agrees to meet with representatives of the City to discuss operation of the farm and plans for the next calendar year and submit for approval a rolling 5 year cropping plan.

6.6. By the 10th of the applicable month, the Lessee shall provide monthly, quarterly, and annual (due January 10th) reports for each field on nitrogen applications and removal, water uses and crop data as required for the Waste Discharge Requirements (WDR) reporting.

6.7. In addition to the terms and provisions provided herein, and unless otherwise stated in this Lease, Lessee shall be required to perform all obligations as set forth in the "Reclamation Area Lease – Request for Proposal", which is attached hereto as Exhibit D and fully incorporated herein by reference.

7. Improvements

7.1. Lessor does not warrant or guarantee the safety, condition, or effectiveness of the improvements on the Premises.

7.2. Existing improvements owned by the City and available for use by the Lessee include:

7.2.1. Pressurized pipeline and appurtenances

7.2.2. Percolation Ponds and Fencing

7.2.3. Storage Yard

7.2.4. One-third (1/3) interest in an Irrigation Well (5N)

7.2.5. One (1) extraction well (Hunsaker Well)

7.2.6. Two (2) Irrigation Wells without Pumps and not connected to an irrigation system (Field 7 &30)

7.3. Lessee with prior written approval from the City will meet with lessor, to discuss the cost and expense, before altering, adding to, and replacing, removing, or demolishing any part of the improvement for or in conjunction with efficient and prudent farming operations and dispersal of effluent

7.3.1. Alterations include changes to the physical land such as removing, adding; or significantly changing ditches, embankments, ponds, and reservoirs as well as drilling and major trenching.

7.3.2. Additions include construction or installation of new buildings, structures, checks, weirs, levees, culverts, roads, head gates, wells, and fences.

7.3.3. Repairs and replacements include those for fences and above and underground pipes and valves and pumps.

7.3.4. Demolishment includes partial or entire destruction and/or removal of any improvements such as fences, posts, structures, etc. and Lessee understands that Lessee shall be solely responsible to properly remove and dispose of such demolished material

7.4. Such alterations, additions, replacements, removals, or demolishment described or implied in Paragraph 7.3 herein above shall only occur after written approval is provided by the City for the specific action to be taken and Lessee has received all other approvals by any governing or regulatory body that exercise control for such changes.

8. Upkeep and Property Management

8.1. Lessee shall be responsible for the general upkeep and maintenance of the Premises. Failure to maintain premises resulting in operational failure or damage to the premises will be corrected at sole expense of lessee.

8.2. STANDING WATER: Lessee shall grade, level, drain and otherwise maintain the Premises in a manner to level any low areas in order to prevent standing and stagnating water on the Premises.

8.3. STORM WATER: Lessee shall properly manage and/or dispose of any storm water entering the Premise.

8.4. TRASH: Lessee shall be responsible for regular and prudent trash, debris, weed, and brush removal from the Premises.

8.5. ROADS: Lessee shall maintain and keep all roads on the Premises, and the farm connection road stated in Paragraph 2 herein above, in good condition and repair and at proper elevation and compaction to limit erosion and provide reasonable two-wheel drive travel.

8.6. EARTHEN IMPROVEMENTS: Lessee shall maintain and keep in good condition and repair all ditches, sumps, ponds reservoirs, and embankments in order to keep the ditches, sumps, ponds, reservoirs, and embankments watertight. Failure to maintain premises resulting in operational failure or damage to the premises will be corrected at sole expense of lessee.

8.7. WEEDS: Lessee shall remove weeds, trash, and debris from and near all ditches, sumps, ponds, reservoirs and embankments, roads, wells, pump stations, and irrigation structures.

8.8. EFFLUENT WATER DISTRIBUTION SYSTEM: Lessee shall at his expense, maintain and keep in good condition and repair existing aboveground and underground water distribution system, which includes pipelines, risers, and valves required for proper irrigation.

8.8.1. Prior to performing repairs lessee must have prior written approval from the City, Any repairs to distribution system must comply with current city codes.

8.9. PUMP/MOTORS: Lessee shall at his expense, maintain, repair, replace, or add pumps/motors used at the irrigation wells, tail water sumps and elsewhere on the Premises after first receiving specific written approval from the City.

8.9.1. Prior to repair, replacement, or adding of pumps/motors lessee must have prior written approval from the City, Any repairs to pumping system must comply with current city codes.

8.10. RODENTS: Lessee shall make frequent and reasonable efforts to minimize ground squirrel population on the Premises

8.11. FENCES AND GATES:

8.11.1. Lessee shall promptly maintain and repair all fences and gates on or that borders the Premises and shall hold the City free and harmless from any liability or loss sustained by Lessee due to trespassers on the Premises.

8.11.2. The City shall replace gates and any sections of fence it deems necessary.

8.12. NON-CROP AREAS :

8.12.1. Lessee shall remove weeds, trash, and debris from and near Percolation Ponds.

8.12.2. Lessee shall maintain and keep in good condition and repair embankments in order to keep the sumps, ponds, and ditches watertight.

8.12.3. Lessee shall conduct farming and non-crop activities as to comply with all air pollution control standards, and to minimize dust.

9. Hazardous Waste and Chemicals

9.1. Lessee shall not use the Premises to dump gas, oils, dairy waste, chemicals or other hazardous waste and shall contact the City immediately if such a release occurs or is found.

9.1.1.Any such release shall be the sole responsibility of Lessee.

9.1.2.Lessee shall be responsible to clean up and cure such release in a timely manner.

9.2. Lessee shall only use chemicals that are reasonable and typically used for farming operations, weed control, and pest control.

10. Electricity

10.1 Lessor shall be responsible to pay utility costs for extraction well (Hunsaker) from April – September. Lessee shall reimburse the lessor for irrigation utility cost of extraction well (Hunsaker) from October – March.

10.2 Lessee shall be responsible to pay all utility costs for irrigation well (5N).

11. Water

11.1 Lessee shall control the flow, reuse, and dispersal of all effluent supplied by the City year round as surface water onto the Premises in a prudent and efficient manner to farm the Premises unless provided specific allowance by the City in writing to disperse portion of the wastewater elsewhere.

11.1.1. Lessee understands that the City production of effluent may vary significantly but may produce peak flows up to 5 million gallons of effluent per day.

11.1.2. Notwithstanding Paragraph 11.1.1 herein above, Lessor expects the typical effluent produced on the Execution Date to be approximately 4.4 million gallons per day, based on the average daily flows from 2009-2013, although Lessor does not guarantee any specific amount of wastewater suitable for irrigation and shall not be liable for

any damages to crops due to insufficient, excess, or oil or chemical contaminated wastewater.

11.1.3. Lessee agrees that the City may decrease or increase the gallons per day of effluent and also agrees to manage any such decreases and increases and to utilize all the effluent on the Premises.

11.2 As required by WDR, Lessee shall provide to the City a written report that shall identify the source of all water and the volume of water in acre feet used on each field no later than the 10th calendar day of the following month.

11.2.1 Lessee may supplement the effluent with well water from the Premises or other water sources that have first been approved in writing by the City.

11.2.1.1 Lessee shall provide a written report that provides the amount of supplemental water (water not supplied by the City) used and dispersed by the Lessee on the Premises.

11.3 Water from existing or new wells on the Premises shall only be used on the Premises for the purposes of this Agreement and shall not be dispersed or sent off the Premises.

11.4 The City does not and shall not supply potable or drinking water to the Premises.

11.5 The City may enter into an Agreement with other property owners for the expressed purpose of providing effluent for irrigation.

12. Crops

12.1. Lessee shall use the Premises and effluent to irrigate the farm, grow and harvest non-human consumable crops, and maintain an agronomic nitrogen balance with the effluent and bio-solids applied to farmed area.

12.2. In the third quarter of each calendar year of this Agreement, Lessee shall, if notified by the City, meet with the City to discuss operation of the farm for the next calendar year.

12.3. Lessee shall have the right to harvest all existing crops up to the date of expiration or termination of this Agreement and shall leave the Premises in good condition.

12.4. Lessor shall not be liable for any crop loss sustained by Lessee for any reason.

12.5. As required by the WDR, Lessee shall provide tissue analysis results and crop yield for each field to the City at Lessee's expense.

13. Biosolids, Fertilizers, and Soil Amendments

13.1. Lessee shall use biosolids and soil amendments on the Premises in accordance with good farming practices, and schedules provided.

13.2. Lessee shall not accept or allow any placement of biosolids, sludge, septage, or similar materials on the Premises from parties other than Lessor and Lessee shall notify Lessor immediately of any unauthorized placement.

13.3. As required by the WDR, Lessee shall provide to the City a written report that states the pounds of nitrogen and any other materials applied to each field over the previous calendar year.

13.4. The five year biosolids application and management plan shall be followed.

13.5. Any Amendment, requested by the lessee, to the biosolids management plan shall be submitted to the City in writing and must be approved by the city prior to October 1st of each year.

13.6. The Lessee will provide the City with all relevant information required verifying compliance with the approved plan for reporting to the governing agencies (CRWQCB and US EPA) by January 15 of each year.
13.7. As required by the WDR, Lessee shall provide the City with annual soil analysis results at Lessee's expense.

14. Percolation Ponds
    14.1. The City owned percolation ponds are to be operated and maintained at the lessee's expense.
    14.2. The ponds are available for use by the Lessee at all times provided less than 50% of all effluent delivered annually to the reclamation area is percolated in the ponds.
    14.3. The ponds shall not be operated in such a manner as to have, or threaten to have a negative impact upon the Teapot Dome landfill from rising ground water levels.
    14.4. The pond bottoms shall be kept open and free of weeds, algae, noxious odors, or other such nuisances.
    14.5. Rodent control is the responsibility of the Lessee, in order to avoid breaching of levees and/or loss of the pond embankments.
    14.6. Lessee must provide mosquito abatement in all pipes, ponds, and other collection areas of the percolation ponds.
    14.7. As required by the WDR, Lessee shall provide to the City a written report that states the amount of effluent in acre feet that was disbursed to the percolation ponds no later than the 10th calendar day of the following month.

15. Security
    15.1. Lessor does not supply security for the Premises and Lessees operation thereon.

    15.2. Lessor does not warrant that the fences and gates within or around the Premises will prevent trespassers.
    15.3. Lessee shall keep all gates closed and locked when not in use during the day and closed and locked during the night.

16. Health and Notice
    16.1. Lessee shall notify its employees, sub-contractors, and visitors to the Premises that the irrigation water used on the Premises is treated wastewater and is not to be used for drinking or other human consumption and to follow good hygiene practices.
    16.2. This notification shall be documented and signed and dated by all Lessee's employees, sub-contractors, and visitors to the Premises and such documentation shall be kept on file with Lessee and shall be presented to the City if requested.
    16.3. Lessee shall provide for all employees who work at the Premises immunization in accordance with any requirements of the Tulare County Health Department.
    16.4. Lessee shall comply with all rules and regulation regarding mosquito control on the Premises and shall bear any and all costs regarding mosquito abatement on the Premises.

17. Inspection and Testing
    17.1. Lessee shall allow:
        17.1.1. The City, the county of Tulare, the State of California, or any other regulatory agency to enter onto the Premises to visit the Premises and to perform any soil, air, water or other tests and samplings

17.1.1.1. Such testing shall be performed in a reasonable manner to minimize any damage to crops.
17.1.1.2. Lessee is aware that such testing could result in partial or complete termination of Lessee's farming operation on the Premises.
17.1.2. The City, the county of Tulare, the State of California, or any other regulatory agency to install monitoring wells on the Premises.
17.1.2.1. The City shall recommend that the agencies work with Lessee to install such wells in locations to minimize hindrance or damage to Lessee's farming operation, but makes no guarantee of locations.
17.1.2.2. Lessee is aware that such testing could result in partial or such complete termination of Lessee's farming operations on the Premises.

17.2. Lessee shall provide to the City a copy of any reports involving test of soil, air, crops, or water within the Premises performed by or for Lessee immediately after receipt of such reports by Lessee.

18. Discharge of Claims, Liens, Taxes

18.1. Lessee shall discharge or provide for the discharge of all claims that it has authorized or incurred for labor, materials, and supplies furnished for or in connection with the Premises.
18.2. Lessee agrees to keep and shall keep the Premises and improvements thereon free and clear from any liens or encumbrances, including mechanics or material men's liens, or any kind or nature for any work done, labor performed, or material furnished for the Premises or Lessee's operations thereon or from any other cause.
18.3. Lessee agrees to indemnify and save harmless the City, its agents, officers, and employees from and against any and all claims, liens, demands, costs and expenses of whatsoever nature for any such work done, labor performed, or material furnished.

18.4. Lessee agrees to pay all taxes (real, personal, possessory interest tax, or whatever other tax) and assessments that may be levied or charged upon the rights of Lessee for Lessee's rights under this Agreements and Lessees' operation here under.
18.5. Lessee shall also obtain and pay for all other Agreements or permits necessary or required by law for the conduct of its operation hereunder.

19. Indemnification

19.1 To the fullest extent permitted by law, Lessee agrees to indemnify, defend (upon request by the City) and hold the City, is agents, officers, and employees, and each of them, harmless from any and all losses, costs, expenses, claims, attorney's fees, liabilities, actions or damages, including liability for death or injury to person or persons or damage to property, arising out of or in any way connected with:
19.1.1. The conducting or operation of Lessee's business on the Premises or pursuant to this Agreement, or
19.1.2. The construction, renovation, remodel, removal, or significant change to the structure facilities, grounds, or improvements on the Premises or pursuant to this Agreement, or
19.1.3. The intentional or negligent conduct of Lessee, its agents, employees, or independent contractors.

20. Insurance: Lessee, in order to protect the City and its council members, officials, agents, officers, and employees against all claims liability for death, injury, loss and damage as a result of Lessee's actions in connection with the performance of Lessee's obligations, as required in this Agreement, shall secure and maintain insurance as described below. Lessee shall not perform any work under this Agreement until Lessee has obtained all insurance required under this Paragraph and the required certificates of insurance have been filed with and approved by the City. Lessee shall pay any deductibles and self-insure retentions under all required insurance policies.
    20.1. Workers Compensation and Employer's Liability Insurance Requirement – Lessee shall submit written proof that lessee is insured against liability for workers' compensation in accordance with the provisions of section 3700 of the Labor Code.
        20.1.1. In signing this Agreement, Lessee makes the following certification, required by section 1861 of the Labor Code.
        20.1.2. "I am aware of the provision of section 3700 of the Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provision of that code, and I will comply with such provisions before commencing the performance of the work of this Agreement."
        20.1.3. Lessee shall require any sub-contractors to provide workers' compensation for all to the subcontractors' employees, unless the sub-contactors' employees are covered by the insurance afforded by Lessee.
        20.1.4. If any class of employees engaged in work or services performed under this Agreement is not covered by Labor Code section 3700, Lessee shall provide and/or require each sub-contractor to provide adequate insurance for the coverage of employees not otherwise covered.
        20.1.5 Lessee shall also maintain employer's liability insurance with limits of two million dollars ($2,000,000) for bodily injury or disease.

    20.2. Liability Insurance Requirements:
        20.2.1. Lessee shall maintain in full force and effect, at all times during the term of this Agreement, the following insurance:
            20.2.1.1. Commercial General Liability Insurance, including, but not limited to, Contractual Liability Insurance (specifically concerning the indemnity provision of this Agreement), Products-Competed Operations Hazard, Liquor Liability, Personal Injury (including bodily injury and death), and Property Damage for liability arising out of Lessee's performance of work under this Agreement. Said insurance coverage shall have minimum limits for Bodily Injury and Property Damage liability of two million dollars ($2,000,000) Combined Single Limit (CSL) each occurrence and two million dollars ($2,000,000) aggregate and shall include an endorsement naming the City and the City's council members, officials, officers, agents and employees as additional insured for liability arising out of this Agreement and any operations related thereto.
            20.2.1.2. Automobile Liability Insurance against claims of Personal Injury (including bodily injury and death) and Property Damage cover all owned, leased, hired and non-owned vehicles used in the performance of services pursuant to this Agreement with minimum limits for Bodily Injury and Property Damage liability of one million dollars ($1,000,000) each occurrence and shall

include an endorsement naming the City and the City's council members, officials, officers, agents and employees as additional insured for liability arising out of this Agreement and any operations related thereto.

20.2.2. If any of the insurance coverage required under this Agreement is written on a claims-made basis, the insurance policy shall provide an extended reporting period of not less than four (4) years following the termination of this Agreement or completing of Lessee's work specified in this Agreement, whichever is later.

20.2.3. Prior to Lessee commencing any of its obligations under this Agreement, evidence of insurance in compliance with the requirements above shall be furnished to the City by Certificate of Insurance naming the City as "additional insured". Receipt of evidence of insurance that doesn't comply with above requirements shall not constitute a waiver of the insurance requirements set forth above.

20.3. Cancellation of Insurance – The above stated insurance coverage required to be maintained by Lessee shall be maintained until the completion of all the Lessee's obligations under this Agreement, and shall not be reduced, modified, or canceled without thirty (30) days prior written notice to the City. Lessee shall immediately obtain replacement coverage for any insurance policy that is terminated, cancelled, non-renewed, or whose policy limits have been exhausted or upon insolvency of the insurer that issued the policy.

20.4. All insurance shall be issued by a company or companies admitted to do business in California and listed in the current "Best's Key Rating Guide" publication with a minimum of an "A-VII" rating. Any exception to these requirements must be approved by the City Risk Manager, or the City employee with Risk Management responsibilities.

20.5. Insurance coverage in the minimum amounts set forth herein shall not be construed to relieve Lessee for any liability, whether within, outside, or in excess of such coverage, and regardless of solvency or insolvency of the insurer that issues the coverage; nor shall it preclude the City from taking such other actions as are available to it under any other provision of this Agreement or otherwise in law.

20.6. Failure by Lessee to maintain all such insurance in effect at all times required by this Agreement shall be a material breach of this Agreement by Lessee. The City, at its sole option, may terminate this Agreement and obtain damages from Lessee resulting from said breach. Alternatively, the City may purchase such required insurance coverage, and without further notice to Lessee, the City shall deduct from sums due to Lessee any premiums and associated costs advanced or paid by the City for such insurance. If the balance of monies obligated to Lessee pursuant to this Agreement are insufficient to reimburse the City for the premiums and any associated cost, Lessee agrees to reimburse the City for the premiums and pay for all costs associated with the purchase of said insurance. Any failure by the City to take this alternative action shall not relieve Lessee of its obligation to obtain and maintain the insurance coverage required by this Agreement.

21. Assignment, Subletting, Merger

21.1. Assignment by Lessee of any or all rights under this Agreement may only occur upon written consent of the City.

21.1.1. Lessee shall submit to the City a written request for assignment or to sublet and provide any information about the proposed assignee or party to sublet that the City may require.

21.1.2. Lessee shall submit in advance a non-refundable sum of $2,500 to the City for each request for assignment or sublet in order to cover costs for processing such request.

21.1.3. The City shall answer Lessee's request for assignment or sublet within 60 days of receipt of such notification by Lessee.

21.1.4. The City may reject the proposed assignment or sublet for any reason and, if so and notwithstanding Paragraph 21.1.2 herein above, the City shall refund $1,500 to lessee.

21.2. At least 120 days in advance of any proposed merger between Lessee and a corporation or any other entity, Lessee shall provide to the City written notice of its intention to participate in such merger and provide any information required by the City in regards to the merger.

21.3 This Agreement shall be binding upon and shall inure to the benefit of the heirs, administrators, executors, successors and assigns of the respective parties hereto.

22. Breach and Default

22.1. Each of the following shall be a default by Lessee and breach of this Agreement:

22.1.1. Lessee shall become insolvent, or shall take the benefit of any present or future insolvency statute, or shall make a general assignment for the benefit of creditors, or file a voluntary petition in bankruptcy, or a petition or answer seeking an arrangement for its reorganization, or the readjustment of its indebtedness under the federal bankruptcy laws or under any other law or statute of the United States, or of any state law, or consent to the appointment of a receiver, trustee, or liquidator, and such act prevents Lessee from conducting its operations under this Agreement for a period of thirty (30) calendar days or more.

22.1.2. By order or decree of a court, Lessee shall be adjudged bankrupt, or an order shall be made approving a petition filed by any other creditors seeking its reorganization of its indebtedness under federal bankruptcy laws, or under any law or statute of the United States, or any state thereof and such act prevents Lessee from conducting its operations under this Agreement for a period of thirty (30) calendar days or more.

22.1.3. A petition under any part of the federal bankruptcy laws, or an action under any present or future solvency law or statute shall be filed against Lessee and shall not be dismissed within ninety (90) days after the filing thereof and such act prevents Lessee from conducting its operation under this Agreement for a period of thirty (30) calendar days or more.

22.1.4. Pursuant to or under authority of any legislative act, resolution or rule or any offer or decree of any court, governmental board, agency, or officer having jurisdiction, a receiver, trustee, or liquidator shall take possession or control of all or substantially all of the property of lessee, and such possession or control shall continue in effect for a period of ninety (90) days and prevents Lessee from conducting its operations under this Agreement for a period of thirty (30) calendar days or more.

22.1.5. Any lien (including, without limitation, mechanic's and materials' liens) is filed against the Premises because of any act or omission of lessee and is not removed within thirty (30) day.

22.1.6. Lessee's voluntary abandonment, desertion, vacating, or discontinuation of its operations as authorized by this Agreement.

22.1.7. Failure to perform any term, covenant, or condition of this Agreement.

22.1.8. Lessee fails to punctually make any payments due to the City under this Agreement.

22.2. Notwithstanding any other remedies of the City under this Agreement, should lessee default or breach this Agreement, the City may terminate this Agreement immediately, re-enter the Premises and take full possession thereof, and remove all persons connected with Lessee there from and Lessee shall have no further claim thereon or hereunder.

22.3. The remedies given to the City in Paragraph 22.2 shall be in addition and supplement to all other rights or remedies that the City may have under the laws then in force.

22.4. Lessee hereby waives any and all rights for redemption granted by or under any present or future law, or statute, arising in the event it is evicted or dispossessed for any cause or in the event the City obtains or retains possession of the Premises in any lawful manner.

22.5. No waiver the City of any default or breach on the part of Lessee in the performance of any of the terms, covenants, or conditions hereof to be performed, kept, or observed by Lessee shall be or be construed to be a waiver by the City of any other or subsequent default or breach in performance of any of said terms, covenants, or conditions contained in this Agreement.

22.5.1. The subsequent acceptance of rent by the City shall not be deemed a waiver of any preceding breach by Lessee of any term, covenant or condition of this Agreement, including the failure of Lessee to pay the particular rental so accepted, regardless of the City's knowledge of such preceding breach at the time of acceptance of such rent.

22.5.2. No covenant, term or condition of this Agreement shall be deemed to have been waived by the City, unless the City provides such waiver in writing.

23. Negation of Partnership

23.1. The City shall not become or be deemed a partner or joint venture with Lessee or associate in any relationship with Lessee other than that of Lessor and Lessee by reason of the provisions of this Agreement.

23.2. Lessee shall not for any purpose be considered an agent, officer, or employee of the City. .

23.3. To whatever extent the City, its agents, officers, or employees may be deemed to be associated with the Lessee or the Lessee's agents, officers, or employees because of any activity or operation pursued by Lessee or its agents, officers or employees on the Premises, then to such extent Lessee shall be deemed an independent contractor of the City.

24. Workers Compensation: Lessee shall comply with the workers' Compensation Act of this State and shall indemnify and save and hold harmless the City from any and all liability under the said Act.

25. Compliance With Law: Lessee shall, at its expense, promptly comply with any and all laws, ordinances, rules, regulations, requirements and orders whatever, present or future, of the federal, state, or City government which may in any way apply to the use, maintenance, occupation of or operations on the Premises, including but not limited to the Americans with Disabilities Act.

26. Nondiscrimination: Lessee, in the operation to be conducted pursuant to the provision to this Agreement and otherwise in the use of Premises, shall not discriminate or permit discrimination

against any person or class of persons by reason of race, color, creed, sex or national origin or by any arbitrary reason.

27. Notices: All notices herein provided to be given, or which may be given, by either party to the other shall be deemed to have been fully given when made in writing and deposited with the United States Postal Service, Registered or Certified, postage prepaid and addressed as follows:

To the Lessee:

_____
_____
_____
_____

To the Lessor (the City of Porterville)

City of Porterville
291 Main Street
Porterville, CA 93257

The address to which the notices may be mailed to either party may be changed by written notice. Nothing, however, shall preclude the giving of any such notice by personal service.

28. Definitions and Terminology
    - 28.1. In this Agreement the capitalized term "Paragraph" shall indicate the numerical subject headings or sub-headings of this Agreement (such as this Paragraph is identified as 28.1)
    - 28.2. In this Agreement the capitalized terms "Section" or "Sections" shall indicate the actual physical location for the certain real property locations, as they exist in Tulare County. (As such, the only Sections to be mentioned in this Agreement will be the Sections as originally stated in Paragraph 1.2 herein above.)
    - 28.3. In the context of this Agreement the terms "wastewater" and "effluent" may be used interchangeably and shall be defined as untreated sewage water that has been channeled to the City treatment plant, treated to certain requirements, and discharged from the treatment plant as non-potable water to be used on the Premises to grow fiber and fodder crops.

29. Damage to Premises:
    - 29.1. In the event more than 20% of the Premises or more than 100 acres of farmed land is declared a disaster area by Federal, State, or local authorities:
        - 29.1.1. Lessee may, within 15 days of such declaration, provide to the City evidence of the declaration, the location and number of acres affected, and petition for temporary relief from rent until the affected real property can reasonably and in a timely manner be restored by Lessee, at its expense , to a condition again usable for Lessee's farming operations, and
        - 29.1.2. The City shall review such petition or request and if found credible shall pro-rate Lessee's rent by:
            - 29.1.2.1. Determining the number of currently farmed acres,

29.1.2.2. Determining the number of current acres deemed not farmable due to the disaster,
29.1.2.3. Determining the number of days the farmed acres are out of production until Lessee can reasonable put the acres back into production,
29.1.2.4. Regarding this Paragraph 29.1, determine an acreage percentage and divide the result by 365 days to determine a day's percentage,
29.1.2.5. Multiply the acreage percentage times the days percentage to determine an overall percentage,
29.1.2.6. Multiply the overall percentage times the annual rent to determine rent credit to Lessee (no more than 30% of the annual rent), and

29.1.3. Within 15 days after the City determines the affected real property can reasonably be farmed by Lessee, the City shall notify Lessee the amount of rent reduction and whether it will be refunded to Lessee soon thereafter by check or credited towards Lessee's next rental payment.

29.2. Should the City determine the Premises or significant parts thereof are rendered unusable for a period of more than 30 days due to no fault of Lessee, the City may determine a refund of rent based on the formula determined in Paragraph 29.1 of this Agreement and pay or credit Lessee for the time period beyond the 30 day period mentioned heron above (NOTE - in this instance the pro-rated rent shall take effect 30 days after the City's reasonable determination of the date the acreage was determined unusable.)

30. Surrender of Premises: On the last day of the term, or sooner termination of this Agreement, Lessee shall peaceable and quietly leave, surrender and yield up to the City the Premises and improvements thereon in good condition, reasonable use and wear thereof, and damage by earthquake, public calamity, by the elements, by act of God or by fire or other circumstances over which Lessee has no control.

31. Authorized Agent of THE CITY: The City Manager, or his designee, is the duly authorized agent of the City for purposes of this Agreement and any obligations assumed hereby by Lessee shall be performed to his satisfaction.

32. Disposition of Improvements and Equipment: Upon termination or expiration of this Agreement, Lessee, may, at Lessee's sole cost and expense, remove its farm equipment and trade fixtures which have been placed on the Premises but not permanently affixed thereto. No real property or improvements to real property shall be removed by Lessee without Lessee first obtaining written approval to remove such real property or improvements to real property.

33. Lost, Stolen, Damaged Property: The City is in no way responsible for Lessee's lost, stolen, or damaged property unless the City or the City's agents take possession of Lessee's property.

34. Right of Ingress and Egress:
    34.1. Lessee shall have reasonable non-exclusive right of way for pedestrian and vehicular travel for ingress and egress to the Premises over property owned and controlled by the City.
    34.2. Lessee's right of way is subject to such reasonable rules and regulations as the City may make from time to time.
    34.3. The City and its invitees shall have the right, at any time, to enter and inspect the Premises, Lessee's operations, and conduct studies, surveys, and tests.

35. Incorporation of Prior Agreements and Amendments:
    35.1 This Agreement contains all agreements of the parties with respect to any matter mentioned.
    35.2 No prior agreement or understanding pertaining to any such matter shall be effective.
    35.3 This Agreement can only be modified as a written agreement, signed by the parties in interest at the time of the modification.

36. Venue: If either Lessee or the City initiates an action to enforce the terms hereof or declare rights hereunder, including actions on any bonds and/or surety agreements, the parties agree that the venue thereof shall be the County of Tulare , State of California.

37. Severability: the invalidity of any provision of this Agreement, as determined by a Court of competent jurisdiction, shall not affect the validity or any other provision hereof.

38. Captions: Paragraph headings in this Agreement are used solely for convenience and shall be wholly disregarded in the construction of this Agreement.

39. Covenants and Conditions: Each provision of this Agreement performable by Lessee shall be deemed both a covenant and a condition.

40. Time of Essence: Time is hereby expressly declared to be of the essence of this agreement and of each and every provision thereof, and each such provision is hereby made and declared to be a material, necessary, and essential part of this Agreement.

41. Attorney's Fees. If any litigation is commenced between the parties to this Lease concerning the Lease or the rights and duties of either in relation to the Lease, the party prevailing in that litigation shall be entitled, in addition to any other relief that may be granted in the litigation, to its cost for the litigation including expert witness fees and a reasonable sum for its attorneys' fees in the litigation, which shall be determined by the court in that litigation or in a separate action brought for that purpose.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement on the day and year first hereinabove written.

City of Porterville

By _____
Milt Stowe, Mayor

APPROVED AS TO FORM
City of Porterville

By _____
City Attorney

Lessee
By _____

Title_____

Business Name _____

APPROVED AS TO FORM

By _____
Legal Counsel for Lessee

Exhibit A – Reclamation Area Legal Descriptions
Exhibit B – Map of Reclamation Area, infrastructure
Exhibit C – Letter of Credit for Lessee
Exhibit D – Reclamation Area Lease Request for Proposal

Reclamation Area Legal Descriptions

Exhibit "A"

Parcel	APN	LEGAL DESCRIPTION	ACRES
City of Porterville Airport Property			
Parcel 1	302080011	SE/4 SEC 5-22-27	160.00
Total			*160.00*
City of Porterville Lease Purchase			
Parcel 2	302110059	E/2 OF N/2 OF SW/4 SEC 8-22-27	40.00
Parcel 3	302100015	LTS 34,35,46,47 ETC PVILLE FRUIT&FARMS TR RM 15-23	127.66
Total			*167.66*
City of Porterville Old Perc Pond /Field # 46			
Parcel 4	302130028	POR NE/4 SEC 18-22-27	46.54
Total			*46.54*
City of Porterville Underhill Property			
Parcel 5	302130008	W/2 OF SE/4 SEC 18-22-27	80.00
Parcel 6	302130007	E/2 OF SE/4 SEC 18-22-27	80.00
		Underhill Homesite (Police Shooting Range)	-15.20
Total			*144.80*
City of Porterville Hunsaker Property			
Parcel 7	302130019	POR S/2 SEC 17-22-27	79.26
Parcel 8	302130021	POR SW/4 SEC 17-22-27	84.14
Total			*163.40*
Total Management Acres			682.40

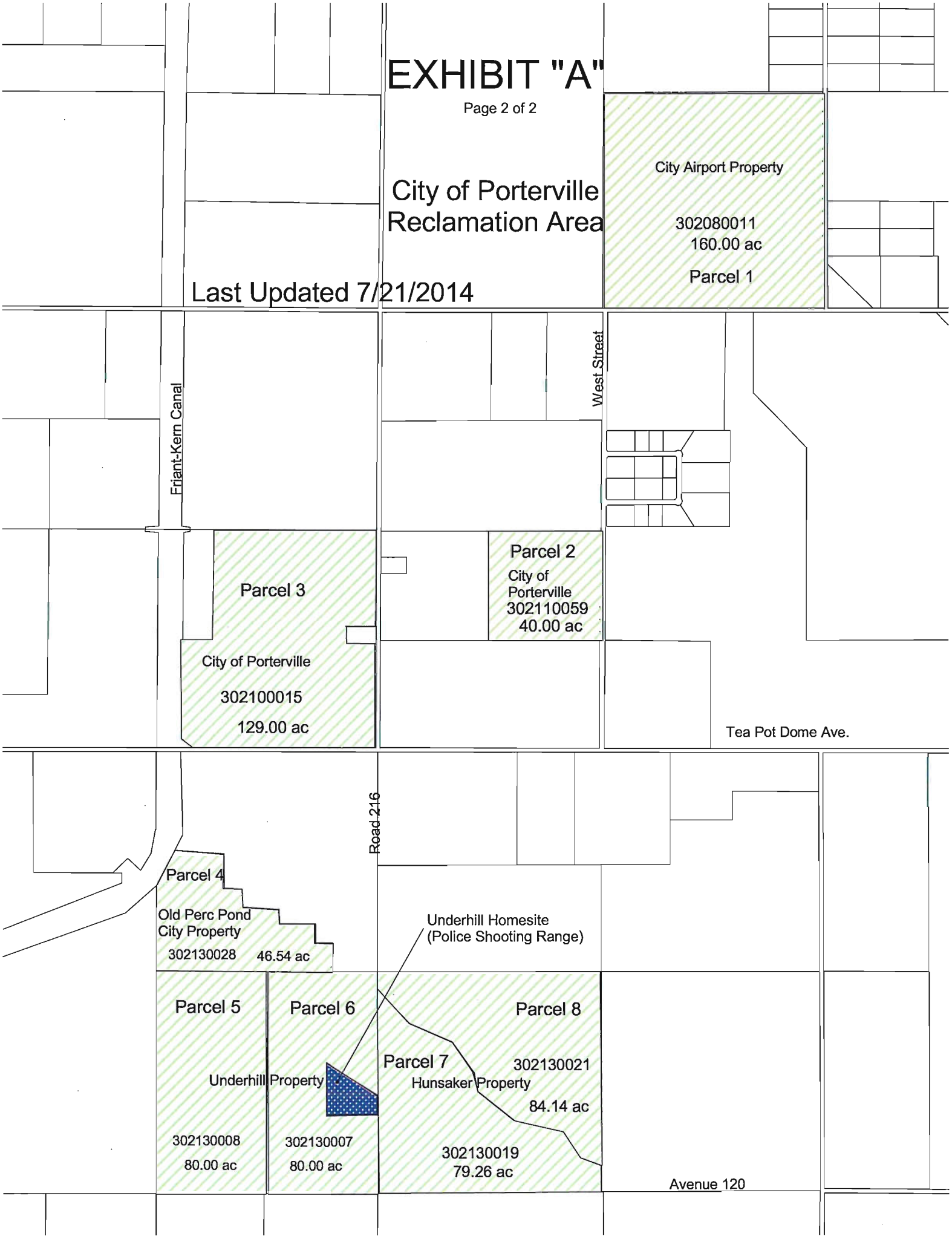
Legal description as supplied in Tulare County 'Parcels.dbf' database dated 6/19/13

EXHIBIT "A"

Page 2 of 2

City of Porterville Reclamation Area

Last Updated 7/21/2014



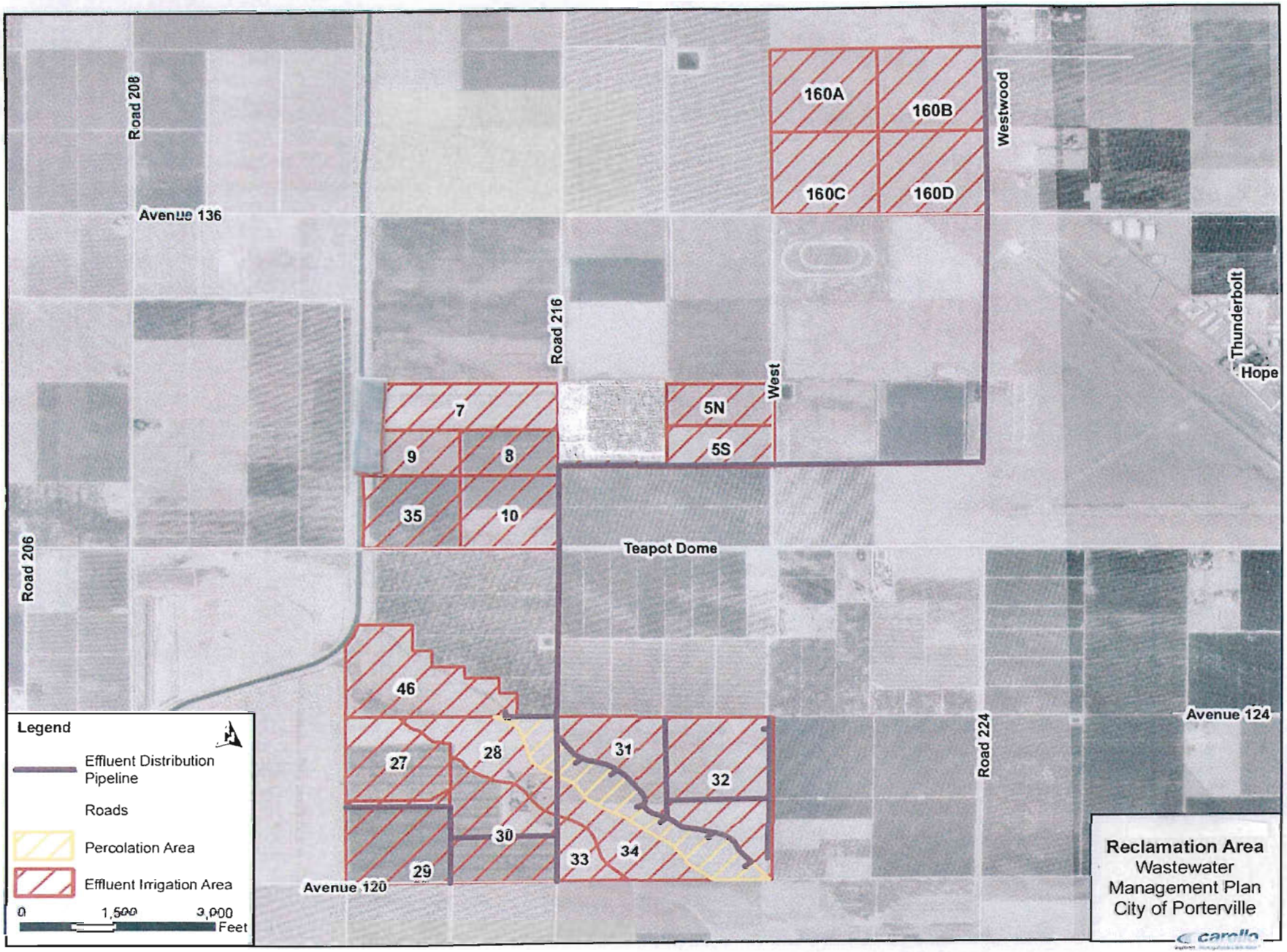

Road 208
Avenue 136
Road 216
Westwood
160A
160B
160C
160D
Thunderbolt
Hope
West
7
9
8
5N
5S
35
10
Teapot Dome
Road 206
46
27
28
31
32
30
33
34
29
Avenue 120
Road 224
Avenue 124
Legend
Effluent Distribution Pipeline
Roads
Percolation Area
Effluent Irrigation Area
0
1,500
3,000
Feet
Reclamation Area
Wastewater
Management Plan
City of Porterville
carollo

EXHIBIT "B"

[Place on Your Letterhead]

Exhibit "C"

[Date]

To: City of Porterville
291 N. Main Street
Porterville, CA 93257

Letter of Credit No.

Gentlemen:

This letter of credit is given to fulfill the requirements of that certain agreement entered into between the City of Porterville, hereinafter referred to as "City", and_____, hereinafter referred to as "Principal", covering Reclamation Area Lease by Principal in accordance with said agreement. Said agreement is attached hereto and made a part hereof by reference.

As required by said agreement, and for the purpose only, we hereby establish in favor of City and for account of our Irrevocable Letter of Credit No._____, in the amount of_____(6 months rent) to be paid by draft at sight of us if accompanied by the following documents:

> City's written statement signed by the _____ or Mayor certifying that there has been loss; damage; or liability resulting from the Principal's performance, or non-performance, of his duty and obligation under said agreement, or from negligence, act, or omission of Principal or his agent, servants or employees, in the amount of the accompanying sight draft on us and the amount of this draft is, therefore, now due and payable.

It is agreed that the above funds are on deposit and guaranteed for payment and said funds shall become trust funds for the purposes set forth herein.

It is further agreed that if City should have to file suit to enforce the provisions of this letter of credit, the prevailing party shall be entitled to all court costs, including reasonable attorney's fees.

All drafts under this Letter of Credit shall be marked Irrevocable Letter of Credit No. _____.

We expressly agree with you that all drafts drawn under and in compliance with the terms of this Letter of Credit shall meet with due honor upon presentation.

NAME OF BANK:

_____
President

_____
Vice President

Exhibit D – Reclamation Area Lease Request for Proposal

Exhibit D of the Executed Lease Agreement will contain the entire RFP and Successful Bidders Proposal

3. Crop Plan, 5-Year

Appendix D Irrigation Schedule - 2015
2009 Biosolids Management Five Year Plan
City of Porterville

Month	Crop Acreage (ac)				Irrigation Demand[1] (acin)				Water Needed for Crop Demand[2] (ac-ft)					Wastewater Application (ac-ft)					Supplemental Water Needed for Crop Demand[3] (ac-ft)					Nitrogen Loading due to Wastewater Application[4] (lbs)				
	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total
			A				B				C					D					E					F		
January	333	31	95	171	1.77	1.77	1.77	0.00	49	5	14	0	68	49	5	14	0	68	0	0	0	0	0	2,496	232	712	0	3,440
February	333	31	95	171	2.80	2.80	2.80	0.00	78	7	22	0	107	78	7	22	0	107	0	0	0	0	0	3,948	368	1,126	0	5,442
March	333	31	95	171	4.48	4.82	4.82	0.00	124	13	39	0	175	124	13	39	0	175	0	0	0	0	0	6,317	639	1,959	0	8,915
April	333	31	95	171	6.63	7.29	7.29	0.00	184	19	58	0	261	184	19	58	0	261	0	0	0	0	0	9,348	957	2,932	0	13,238
May	333	31	95	171	8.67	4.67	4.67	3.41	248	13	39	46	346	248	13	35	46	346	0	0	0	0	0	12,567	639	1,959	2,489	17,654
June	333	31	95	171	10.67	0.00	5.67	7.35	291	0	44	105	439	291	0	44	105	440	0	0	0	0	0	14,769	0	2,241	5,227	22,237
July	333	31	95	171	11.17	0.00	13.24	10.71	310	0	105	153	567	249	0	66	122	455	61	0	21	50	82	12,631	0	4,271	6,218	23,120
August	333	31	95	171	10.40	0.00	11.71	9.47	291	0	93	136	519	260	0	63	120	443	31	0	10	16	47	13,887	0	4,203	6,120	23,510
September	333	31	95	171	8.02	0.00	8.67	7.02	223	0	70	100	393	223	0	70	100	393	0	0	0	0	0	11,308	0	3,568	5,093	19,969
October	333	31	95	171	5.47	0.00	3.45	3.24	152	0	27	46	225	152	0	27	46	225	0	0	0	0	0	7,713	0	1,388	2,347	11,448
November	333	31	95	171	2.57	1.29	1.29	0.00	71	3	10	0	85	71	3	10	0	85	0	0	0	0	0	3,624	165	519	0	4,312
December	333	31	95	171	1.33	1.33	1.33	0.00	37	3	11	0	51	37	3	11	0	51	0	0	0	0	0	1,875	171	535	0	2,581
Total					74.01	24.22	67.06	41.21	2,055	63	531	587	3,236	1,963	63	500	642	3,068	93	0	31	45	123	99,732	3,179	25,414	27,564	155,889
														App. Rate	5.8	2.0	5.3	3.7	4.9	0.3	0.0	0.3	0.3	0.7					

Notes:
Total acreage = 630.0

(1) Irrigation demand determined by agronomist
(2) C = A x B/12
(3) E = C - D
(4) F = D x 23.58 (nitrogen concentration) x 0.3258 x 8.34

Crop	Area (acres)	Nitrogen Uptake (lbs/acre)	Allowable Nitrogen Application Loading (lbs)
Alfalfa	333	480	159,840
Oat Hay	31	115	3,565
Oat Hay/Sudan	95	440	41,800
Cotton	171	175	29,925
Total	630		235,130

Crop	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton
(1) Water Needed for Crop Demand (ac-ft/year)	2,055	63	531	587
(2) Nitrogen applied (lbs/year)	**104,433**	**3,179**	**26,975**	**29,830**
(3) Acres Planted per year (ac/year)	333	31	95	171
(4) Nitrogen Uptake Required by crops (lbs/ac)	480	115	440	175
(5) Max. Nitrogen that can be applied (lbs/year)	**159,840**	**3,565**	**41,800**	**29,925**
(6) Excess Nitrogen available for Biosolids application	**55,407**	**386**	**14,825**	**95**

5 = (3 x 4)
2 = 1 x (ww N conc)(.3258)(8.34)

Wastewater Nitrogen Concentration (mg/L) 18.7
Supp. Water Nitrogen Concentration (mg/L) 0
Total N Applied from effluent used for irrigation
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)
Total N Applied from effluent used for irrigation
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)

5. Copy of General Order, Biosolids Utilization

STATE WATER RESOURCES CONTROL BOARD
WATER QUALITY ORDER NO. 2004 - 0012 - DWQ

GENERAL WASTE DISCHARGE REQUIREMENTS FOR THE DISCHARGE OF BIOSOLIDS TO LAND FOR USE AS A SOIL AMENDMENT IN AGRICULTURAL, SILVICULTURAL, HORTICULTURAL, AND LAND RECLAMATION ACTIVITIES (GENERAL ORDER)

The State Water Resources Control Board (hereinafter referred to as the SWRCB) finds that:

1. Applications for the use of treated municipal sewage sludge meeting the requirements specified in Part 503 in Title 40 of the Code of Federal Regulations (CFR) (hereinafter referred to as biosolids) as a soil amendment have been received and waste discharge requirements (WDRs) have been issued by several of the nine Regional Water Quality Control Boards (RWQCBs). Section 13274 of the California Water Code (CWC) requires the SWRCB or RWQCBs to prescribe General WDRs for the discharge of biosolids used as a soil amendment. This General Order is intended to satisfy the requirements of CWC section 13274 and is intended for discharges of biosolids for use as a soil amendment. This General Order assists in streamlining the regulatory process for such discharges but may not be appropriate for all sites using biosolids due to particular site-specific conditions or locations. Such sites are not precluded from being issued individual WDRs. For the purposes of this General Order, biosolids do not include septage. Biosolids material applicable for coverage under this General Order is as described below:

    a. All Class A biosolids not meeting the requirements contained in Table 3 of 40 CFR Part 503.13 and Class B biosolids that are land applied for agricultural, silvicultural, horticultural, and land reclamation activities;

    b. All Exceptional Quality (EQ) biosolids-derived mixtures consisting of more than or equal to 50 percent biosolids (dry weight) applied at more than 10 dry-tons per acre per year for use as a soil amendment to continuous fields/plots greater than 20 acres for agricultural, silvicultural, horticultural, and land reclamation activities and where the said fields/plots are owned or operated by the same person, company, or partnership;

    c. All EQ biosolids-derived mixtures consisting of 50 percent biosolids or less (dry weight) applied at more than 20 dry-tons per acre per year for use as a soil amendment to continuous fields/plots greater than 20 acres for agricultural, silvicultural, horticultural, and land reclamation activities and where the said fields/plots are owned or operated by the same person, company, or partnership.

2. EQ biosolids may not necessitate regulation in the future. However, it is believed that large scale uses currently require oversight regardless of the actual threat to water quality while done at agronomic rates and using best management practices. Accordingly, this General Order can be applied to such sites to ensure that biosolids are being properly used and are not used in an activity of unregulated

dumping. This regulatory tool may be used to regulate material that is land applied at a high loading rate in order to discourage poor biosolids management and to reduce risk to the public and the environment.

3. Within this General Order, the following terms are described as follows:

   a. Agriculture: The practice, science, or art of using the soil for the production of crops and/or raising livestock for human use.

   b. Agricultural Mineral: Any material containing nitrogen, available phosphoric acid, or soluble potash, singly or in combination, in amounts less than 5 percent or any substance containing essential secondary nutrients or micronutrients that is distributed for use in agriculture, silviculture, horticulture, and land reclamation activities for the purpose of promoting plant growth.

   c. Agronomic Rate: The nitrogen requirements of a plant needed for optimal growth and production, as cited in professional publications for California or recommended by the County Agricultural Commissioner, a Certified Agronomist or Certified Soil Scientist.

   d. Applier: Person, group of persons, or company that applies biosolids for use as a soil amendment.

   e. Arid: Arid lands are those areas where the long term annual average rainfall is below 250 millimeters (less than 10 inches).

   f. Biosolids: Sewage sludge that has been treated and tested and shown to be capable of being beneficially and legally used as a soil amendment for agriculture, silviculture, horticulture, and land reclamation activities as specified under 40 CFR Part 503.

   g. Buffer Zones: An area of land that provides a separation distance between the land application site and an area of concern.

   h. Class A Biosolids: Biosolids meeting the vector attraction, and meeting pollution concentration limits specified in 40 CFR Part 503 and pathogen reduction standards specified in 40 CFR Part 503.32(a).

   i. Class B Biosolids: Biosolids meeting the vector attraction and meeting pollution concentration limits specified in 40 CFR Part 503 and pathogen reduction standards specified in 40 CFR Part 503.32(b).

   j. Depth to Ground Water: The distance from the land surface elevation to the seasonal high water table.

   k. Domestic Water Supply Well: A well that provides water used for human consumption.

   l. EQ Biosolids: Biosolids which meet metals standards, Class A pathogen reduction standards, and vector attraction reduction standards contained in

40 CFR Part 503.13 (Table 3), 40 CFR Part 503.32, and 40 CFR Part 503.33, respectively.

m. Fallow: Fallow lands are areas that have not been cultivated during the growing season but do not include areas that have been tilled, disked, or otherwise distributed to control weeds or conserve soil moisture during such season.

n. Fertilizing Material: Biosolids with 5 percent or more of nitrogen, available phosphoric acid, or soluble potash, singly or in combination.

o. Generator: Municipal Wastewater Treatment Facility or Sewage Sludge Treatment Facility.

p. Grower: Person or entity primarily responsible for planting, maintaining, and harvesting or allowing the use of crops and/or range land for domestic animal or human use.

q. Gully erosion: Erosion cut by a concentrated but intermittent flow of water usually during and immediately following heavy rains or after ice/snow melt. A gully generally is an obstacle to wheeled vehicles and too deep (e.g., > 0.5 meter) to be obliterated by ordinary tillage.

r. High Potential for Public Exposure Areas: Land located within one-half mile of educational facilities, facilities designated for recreational activities other than hunting, fishing, or wildlife conservation, places of public assembly, hospitals, or similar sensitive receptors.

s. Horticulture: The practice, science, or art of cultivating the soil to produce fruit, vegetables, or ornamental plants for human use.

t. Key Operating Personnel: Those individuals responsible for the oversight of daily operations, management decisions, and planning of biosolids land application projects.

u. Low Potential for Public Exposure Areas: Land not meeting the definition of High Potential for Public Exposure Areas.

v. Label: The display of all written, printed, or graphic matter on the immediate container of, or a statement including the guaranteed analysis, accompanying fertilizing material as required by the California Department of Food and Agriculture.

w. Land Reclamation: The practice of revitalizing or restoring lands that are damaged from past or present human land use practices.

x. Long-Term Storage Facility: Site which holds biosolids for more than seven days consecutively.

y. Micronutrients: Refers to boron, chloride, cobalt, copper, iron, manganese, molybdenum, sodium, or zinc.

z. Municipal Wastewater Treatment Facilities (treatment facilities): Facilities designed to collect and treat wastewater generated from primarily domestic sources for environmentally safe reuse or disposal.

aa. Notice of Applicability: Written notice that a biosolids land application site is required to comply with the provisions of this General Order and that applications according to the General Order may commence.

ab. Notice of Intent (NOI): Application for coverage under this General Order, as attached. The NOI is also a notification form for the public and interested parties for this General Order.

ac. Notice of Termination (NOT): Request form to discontinue coverage of this General Order.

ad. Nuisance: Nuisance means anything which meets all of the following requirements:

(1) Is injurious to health, or is indecent and offensive to the sense, or is an obstruction to the free use of property so as to interfere with the comfortable enjoyment of life and property.

(2) Affects at the same time an entire community or neighborhood or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

(3) Occurs during, or as a result of, the treatment or disposal of wastes.

ae. Pathogens: Disease causing agents including helminths, bacteria, viruses, and protozoa.

af. Pathogen Reduction: Process used to destroy pathogenic material contained in sewage sludge.

ag. Pollution: Means an alteration of the quality of the waters of the State by waste to a degree which unreasonably affects either of the following:

(1) The waters for beneficial uses.

(2) Facilities which serve these beneficial uses.

ah. Secondary Nutrients: The elements of calcium, magnesium, and sulfur.

ai. Septage: Waste material removed from a septic tank, cesspool, portable toilet, Type III marine sanitation device, or similar wastewater handling device that has not passed through a municipal wastewater treatment facility.

aj. Sewage Sludge: The solid, semisolid, or liquid residue generated during the treatment of domestic sewage in a municipal wastewater treatment facility. Sewage sludge includes solids removed or used during primary, secondary, or advanced wastewater treatment processes. Sewage sludge does not include grit

or screening material generated during preliminary treatment of domestic sewage at a municipal wastewater treatment facility.

ak. Short-Term Storage: Biosolids storage sites used as a temporary holding facility for less than or equal to seven days.

al. Silviculture: The practice, science, or art of managing, developing, and harvesting forests and trees for human use.

am. Soil Amendment: Applications of a fertilizing material or agricultural mineral for the purpose of promoting utilization by plants and other living organisms with the goal of a net gain in soil productivity.

an. Staging Area: Area used to hold biosolids for less than 48 hours prior to use for the specified activity listed in the NOI.

ao. Tailwater: Excess water from crop irrigation resulting in a discharge off site to a surface water body.

ap. Vector Attraction: Characteristic of biosolids that attracts potential pathogen transmitters such as flies, rodents, and other animals or organisms.

aq. Water-saturated soil: Water content of the soil such that any further addition of water will result in runoff, standing water, or percolation of water through the displacement of existing soil water.

4. Treatment facilities serve urban and suburban population areas by collecting and treating municipal wastewater and reusing or disposing of wastewater effluent. While serving the public in this manner, significant amounts of sewage sludge are generated. This material is typically further treated (stabilized) and dewatered resulting in biosolids as a product of the wastewater treatment process. Biosolids can be managed using a variety of options including: (a) disposal in a sanitary landfill, (b) incineration, (c) placement into a landfill dedicated for this purpose, (d) use as daily landfill cover, and (e) use in land application operations, including reclamation, horticulture, agriculture, and silviculture. As population increases and technological improvements in wastewater treatment processes occur, the amount of biosolids generated in California is likely to increase significantly.

5. Particularly in urban areas, industrial sources discharge into wastewater collection systems. Many of these discharges are regulated by pretreatment programs implemented pursuant to 40 CFR Part 403. These programs restrict industries from discharging toxic pollutants in concentrations creating concerns for the treatment facilities.

6. As a result of domestic and industrial uses, pollutants enter the collection system of treatment facilities. The majority of the pollutant load treated at the treatment facilities is organic matter. This material is removed through flotation and/or settling or is converted to biological solids and then removed through settling prior to discharge. The settled material is then further treated to stabilize organic matter which constitutes the majority of the domestic sewage sludge. Metals from domestic and industrial sources are also present in the waste stream at the treatment facility. These pollutants are removed from the waste stream and concentrated in

the sewage sludge. Organic chemicals can also be present from domestic and industrial uses of water. The fate of these pollutants is variable. Some are removed and destroyed through physical and biological processes at the treatment facility. Others may concentrate in the sewage sludge. Some pass through the treatment facilities unchanged and are subsequently discharged from the treatment process. A portion of the organic chemicals concentrated in the sewage sludge is degraded during sludge stabilization processes. Some organic chemicals can remain in the sewage sludge unchanged. For these reasons, testing of sewage sludge is necessary prior to it being classified as biosolids.

7. Biosolids are a source of organic matter, nitrogen, phosphorus, and micronutrients. These materials are beneficial to agriculture, silviculture, horticulture, and land reclamation activities and they improve agricultural productivity. More specifically, the benefits derived from biosolids used as a soil amendment are as follows:

   a. Nitrogen is a basic nutrient for plant growth. In biosolids, it is present in the forms of ammonia, nitrates, and organic nitrogen at concentrations from two to 10 percent by weight on a dry weight basis. The ammonia and nitrate forms of nitrogen are available for plant usage. Organic nitrogen is release slowly (mineralized) over many months, providing a continuous supply of nitrogen for crops and minimizing the potential for movement of nitrogen to the ground water. Ammonium and nitrate (and some nitrite) are the available forms of nitrogen that are taken up by the plants and some form salt reserves and mineralized organic nitrogen in the soil. Total nitrogen available to the plant at any given time is less than the total of these mineral forms due to the dynamic cycling of nitrogen in the soil.

   b. Phosphorus is a basic nutrient for plant growth and is present in all biosolids in varying concentrations.

   c. Micronutrients, including a variety of salts and metals, are necessary for plant growth and are present in biosolids in varying amounts.

   d. The addition of biosolids to soils can also be beneficial by enhancing soil structure, increasing water retention capability, promoting soil aggregation, and reducing the bulk density. Organic matter assists in maintaining soil pores which allow water and air to pass through the soil medium. Such pores can be lost at sites under continuous cultivation and they are critical in maintaining an aerobic environment within the plant root zone.

   e. Organic matter helps soils retain water. Additional water retention can reduce the need for frequent water applications and can facilitate water conservation in the soil column.

   f. Liming agents are available when the biosolids have been chemically stabilized with lime. Liming agents increase soil pH and can improve the permeability of the soils. Higher pH soils have a greater propensity to bind most heavy metals, decreasing the chance of the metals migrating to the ground water.

8. Biosolids have the following characteristics which can create water quality and public health problems if improperly treated, managed, and regulated during use as a soil amendment:

   a. Pathogens can be present. Unless the biosolids are specially treated or disinfected to destroy pathogens, significant concentrations of bacteria, viruses, and parasites can remain. Public health problems can be prevented with appropriate control over public access to the application areas and restrictions on the type and use of crops grown on the application sites. Buffer zones around water supply wells, surface water drainage courses, and public areas are designated to prevent transmission of pathogens to the public.

   b. Heavy metals will be present. If heavy metals are over-applied to a field, they can cause ground water pollution, toxicity to plants, toxicity/adverse effects to soil microorganisms, or buildup in the plant tissues. A buildup of metals in plant tissues may allow transmission of the metals into the food chain which is the cause of toxicity/adverse effects to animals eating plants or animals containing elevated metals. Future cropping or other land uses could be restricted. Only some of the metals commonly found in biosolids are known to cause water quality or public health problems. Application rates for those metals have been established to avoid the problems.

   c. Nitrogen can be over-applied, allowing a buildup of nitrogen in soils. Excess nitrogen will eventually be converted to the nitrate form and it can migrate to ground water. Excess nitrate in the ground water can result in the exceedance of drinking water standards and a public health threat. Nitrogen over-application can be prevented by biosolids application at an agronomic rate, that is, by matching the application rate of the nitrogen to the nitrogen usage rate of the crops and to soil permeability and soil retention capability.

   d. Odor and insect nuisances can be caused if the biosolids have not been adequately treated (stabilized) prior to application or if wet biosolids are allowed to remain on the ground surface for several days. Compliance with State and federal standards for stabilization of the biosolids will minimize the potential for odors and insect nuisances. Proper management at the application site will prevent odor or insect nuisances. Properly stabilized biosolids will generate limited, transient odors in the immediate vicinity of the application operations. Adequate buffer zones around residences and public areas, therefore, should be provided.

   e. Discharge of organic matter, metals, and pathogens to surface waters can affect water quality. These effects can be prevented by controlling field runoff. The water quality threat of organic matter of biosolids origin affecting surface water is no greater than for a similar quantity of other organic soil amendments.

9. The U. S. Environmental Protection Agency (USEPA) has promulgated 40 CFR Part 503 for the use of biosolids as a soil amendment. These regulations establish ceiling concentrations for metals and pathogen and vector attraction reduction standards; management criteria for the protection of water quality and public health; and annual and cumulative discharge limitations of persistent pollutants, such as heavy metals, to land for the protection of livestock, crop, and

human health and water quality protection. The requirements of 40 CFR Part 503 are based on a risk-based evaluation using 14 different pathways.

10. The National Research Council established a committee to review the methods and procedures used by the USEPA while forming the basis of the 40 CFR Part 503. The National Research Council's members are drawn from the National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine. Committee members included university professors from the schools of law, science, and agriculture; a state health official; a food industry professional; a professional from a sanitation agency; and a professional consultant. After a three-year study (starting in 1993), the committee made some recommendations for improvement of the regulations and data from which they are based but also stated: "Established numerical limits on concentration levels of pollutants added to cropland by sludge are adequate to assure the safety of crops produced for human consumption." As a result of the peer review, monitoring for organic chemicals and using fecal coliform testing as a parameter for determining Class A level pathogen reductions is included in this General Order.

11. This General Order establishes a regulatory system to manage biosolids in a manner that is reasonably protective of public health and the environment to the extent of present scientific knowledge. The beneficial use of biosolids through land application under this General Order is environmentally sound and preferable to non-beneficial disposal.

12. Due to the extensive work done by the USEPA, this General Order is using the 40 CFR Part 503 requirements as baseline requirements for compliance. However, this General Order is applicable to sites where biosolids are applied to land and is not intended to solely regulate the generator (unless the generator is also the landowner or land applier). The 40 CFR Part 503 permit requirements are only intended for and enforceable against the generator. Therefore, this General Order does not constitute compliance with 40 CFR Part 503. Since the SWRCB is not delegated with authority for the Federal Biosolids Program, the USEPA is the only authority to determine compliance with 40 CFR Part 503.

13. Each discharger covered by this General Order shall submit an application fee equal to the annual fee, pursuant to CWC section 13260. The amount of the fee is currently determined by the type of order issued, the threat to water quality, and complexity of the specific discharge, as detailed in Section 2200, Chapter 9, Division 3, Title 23, California Code of Regulations (CCR). Biosolids application projects greater than or equal to 40 acres are deemed as Non-Chapter 15 WDRs with a Category "II" threat to water quality rating and a Category "b" complexity rating. Biosolids projects consisting of less than 40 acres are deemed Category "III" threat to water quality rating and a Category "b" complexity rating.

14. This General Order may be periodically revised to reflect changes in federal or State laws or regulations or policies of the SWRCB or RWQCB.

15. Under CWC section 13263, the SWRCB can prescribe General WDRs for categories of discharges which involve the same or similar waste type or those which are produced by the same or similar operations.

16. This General Order shall primarily apply to both the landowner of sites using biosolids and the biosolids generator, but may also include, as determined by those involved in the operation, the individuals, or companies, transporting and placing the biosolids in the field and the land lessee in conjunction with the landowner and the generator. To obtain coverage under the General Order, a complete NOI and an appropriate fee must be submitted to the RWQCB. Once a completed application is submitted, RWQCB staff will evaluate the project to determine if it is suitable for regulation under this General Order and the corresponding California Environmental Quality Act (CEQA) document. Only after a determination of applicability is made will the discharger be issued a Notice of Applicability by the RWQCB Executive Officer. Only applicants (dischargers) who submit a complete NOI, appropriate fee, and are issued a Notice of Applicability are authorized to land apply biosolids at an agricultural, horticultural, silvicultural, or land reclamation site as a soil amendment onto the land specified in the NOI in compliance with the terms and conditions of this General Order. If it is determined that a local agency already adequately regulates the activity subject to this permit, the RWQCB may choose not to issue this General Order in order to avoid any duplicative regulation.

17. A separate NOI and filing fee must be filed for each biosolids use project to be eligible for coverage under this General Order. A separate NOI and filing fee must be filed for each landowner involved in a reuse project. Attachment A to this General Order contains an NOI form which details the minimum contents of the NOI. A single reuse project will be limited to sites comprising not more than 2,000 net acres available for application. Net acreage is the land available for application, excluding roads, surface water drainage, and required buffer areas. The sites comprising a single reuse project shall be contained within a ten-mile radius of a given location. There is no restriction on the number of NOIs which may be filed for reuse within any geographic area. A single reuse project may be a one-time application or may be repetitive applications to the same parcel. Filing fees are annual fees. Projects will be billed for an annual fee equaling the filing fee until the project is completed and coverage under the General Order has been terminated.

18. As a condition for the review of each individual NOI submitted for a proposed biosolids application project under the GO, the RWQCB staff responsible for issuing the NOA will:

    a. evaluate whether the proposed discharge will occur within an area designated as having existing nitrate contamination problems and

    b. evaluate whether the proposed discharge will pose an imminent threat of contributing to or causing exceedances of water quality standards for nitrate.

19. As a result of the review discussed in Finding No.17 , if the responsible RWQCB staff finds that either condition exists, the RWQCB staff will minimize the potential water quality impacts of the project by requiring the applicant to modify the proposed discharge activities or provide additional information to verify that the proposed discharge will not cause or contribute to violations of water quality standards. Verification that the proposed project will not cause or contribute to water quality degradation will require that sufficient information be submitted by a qualified civil engineer, agricultural engineer, professional hydrogeologist or other

qualified professional such that the RWQCB staff could make a finding that the proposed discharge will be in compliance with provisions of the GO. If the RWQCB staff finds that modifications to the proposed discharge are necessary for compliance with provisions of the GO, such modifications will consider, but will not be limited to, the following:

a. requirements for the discharger to use the services of a certified agronomist, crop advisor, or agricultural engineer to develop additional management practices related to: 1) determining the agronomic rate for biosolids application projects that include all sources of nitrogen applied to the application site; 2) developing overall farm water, cropping, and fertility management practices; and 3) evaluating the potential for nitrate leaching or impairment of offsite groundwater use;

b. requirements of the discharger to provide additional groundwater monitoring in areas where groundwater is found at depths greater than 25 feet or there exist other identified local hydrogeologic conditions that could make the groundwater susceptible to contamination;

c. requirements of the discharger to identify whether the proposed biosolids application site is within an area where Drinking Water Source Water Assessment and Protection (DWSWAP) Program setback requirements are implemented for municipal and domestic wells; and

d. requirements of the discharger to consider the unique local site and hydrogeologic conditions in the design of the project and/or other groundwater quality management or regulatory programs that are currently active in the area.

20. This General Order sets minimum standards for the use of biosolids as agricultural, horticultural, silvicultural, or reclamation site soil amendments, and it does not preempt or supersede the authority of local agencies to prohibit, restrict, or control the use of biosolids subject to their control, as allowed under current law. It is the responsibility of the discharger to make inquiry and to obtain any local governmental agency permits or authorizations prior to the application of biosolids at each site.

21. Some areas in California have been designated as unique and valuable public resources. Such areas have been defined in the State law and the CCR as jurisdictional waters or preserves or have been addressed through acts specifically intended to preserve and manage the resource. This General Order is not applicable to those areas as described below:

a. The Lake Tahoe Basin.

b. The Santa Monica Mountains Zone as defined by section 33105 of the Government Code.

c. The California Coastal Zone, as defined in and mapped pursuant to Public Resources Code (PRC) section 30103.

d. An area within one quarter mile of a wild and scenic river, as defined by PRC section 5093.5.

e. The Sacramento-San Joaquin Delta, as defined in CWC section 12220.

f. The Suisun Marsh, as defined in (PRC) section 29101.

g. The jurisdiction of the San Francisco Bay Conservation and Development Commission, as defined in Government Code section 66610.

h. The following prohibition areas contained in the Water Quality Control Plan[1] of the Lahontan RWQCB:

(1) Glenshire and Devonshire Subdivisions, Town of Truckee

(2) Areas southwest of Piute Creek and north of Susan River and included in Sections 21, 25, 26, 27, 28, 33, 34, 35, and 36, T30N, R11E, MDB&M

(3) Eagle Lake Basin-Spaulding Tract, Stones-Bengard Subdivision, and Eagle's Nest Summer Home Tract

(4) Mono-Owens Planning Area

(a) Rush Creek Watershed above the outlet of Grant Lake

(b) Mammoth Creek Watershed, including the drainage area of the community of Mammoth Lake, and the Sherwin Creek Watershed upstream of the confluence of Sherwin and Mammoth Creeks

(c) Inyo County Service Area No. 1

i. Assessment District No. 1
ii. Assessment District No. 2
iii. Rocking K Subdivision
iv. City of Bishop

(5) Antelope Valley Planning Area

(a) The Antelope Hydrologic Unit above an elevation of 3,500 feet

(6) Mojave River Planning Area

(a) The Silverwood Lake Watershed

(b) The Deep Creek Watershed above an elevation of 3,200 feet

(c) The Grass Valley Creek Watershed above an elevation of 3,200 feet

[1] A detailed description of the prohibition areas can be found in the Lahontan RWQCB's Water Quality Control Plan (Basin Plan)

(d) Area north of State Highway 18 within the area commonly known as Apple Valley and Desert Knolls

(7) Hilton Creek/Crowley Lake communities

22. The biosolids applied to land under this General Order are non-hazardous decomposable wastes applied as a soil amendment pursuant to best management practices and, as such, are exempt from the requirements of Title 23, CCR, Section 2510, et seq., (Chapter 15), in accordance with Section 2511(f).

23. The construction and use of biosolids storage facilities allowed by this General Order are for short-term storage of biosolids in the event that biosolids cannot be immediately applied to the ground surface because of an unanticipated event, such as mechanical breakdown of equipment or an unseasonable rainstorm. Because of the short period of storage allowed by this General Order, the stockpiled biosolids are not a threat to the quality of underlying ground water; thus, the storage basins need not be regulated as either a waste pile or surface impoundment under Title 27 of the CCR. If long-term storage is proposed, the discharger will need to apply for a separate WDR for the long-term biosolids storage facility. Biosolids application to land associated with a project using a permitted long-term biosolids storage basin may be conducted under this General Order, if appropriate.

24. Ground water and surface waters of California have been evaluated for their maximum potential beneficial uses. Those use categories are discussed below:

a. The designated beneficial uses of surface waters within the State are:

(1) Municipal Supply (MUN)
(2) Agricultural Supply (AGR)
(3) Aquaculture (AQUA)
(4) Fresh Water Replenishment of Salton Sea (FRSH)
(5) Industrial Service Supply (IND)
(6) Ground Water Recharge (GWR)
(7) Water Contact Recreation (REC I)
(8) Noncontact Water Recreation (REC II)
(9) Warm Water Habitat (WARM)
(10) Cold Freshwater Habitat (COLD)
(11) Wildlife Habitat (WILD)
(12) Hydropower Generation (POW)
(13) Preservation of Rare, Endangered, or Threatened Species (RARE)

b. The designated beneficial uses of ground waters in California are:

(1) MUN
(2) IND
(3) AGR
(4) AQUA
(5) WILD

Some ground water and surface waters have fewer beneficial uses. Beneficial uses for specific water bodies can be found in the applicable RWQCB's Water Quality Control Plan (Basin Plan).

25. On July 22, 2004, in accordance with CEQA (PRC, Section 21000, et seq.), the SWRCB adopted a Mitigated Environmental Impact Report No. 99062108 for these General WDRs.

26. The SWRCB has notified all known interested agencies and persons of its intent to prescribe General WDRs for the reuse of biosolids as a soil amendment and has provided them with an opportunity for a public hearing and an opportunity to submit comments.

27. The SWRCB, in public meetings on March 2 and July 7, 2004, heard and considered all comments pertaining to the General Order.

28. Amendments to this General Order have been evaluated by the SWRCB in light of the Environmental Impact Report just certified and the substantial evidence before the Board, and the SWRCB finds such amendments to be consistent with the analysis contained therein. The SWRCB finds that there will be no additional potentially significant environmental impacts or substantial increase in the severity of previously disclosed environmental impacts caused by the amendments to the General Order.

IT IS HEREBY ORDERED that all dischargers that file an NOI indicating their intention to be regulated under provisions of this General Order, and all heirs, successors, or designees, in order to meet the provisions contained in Division 7 of CWC and regulations adopted thereunder, shall comply with the following:

A. PROHIBITIONS

1. The discharge of biosolids is prohibited unless the discharger has submitted an NOI, filing fee, and a pre-application report and in response to these submittals, the RWQCB has issued a Notice of Applicability, individual WDRs, or a waiver of WDRs for the discharge.

2. Applications of biosolids shall be confined to the designated use areas stated and shown in the NOI and pre-application report.

3. The discharge shall not cause or threaten to cause pollution, as defined in CWC section 13050.

4. The application of any material that results in a violation of the Safe Drinking Water and Toxic Enforcement Act (Health and Safety Code section 25249.5) is prohibited.

5. The storage, transport, or application of biosolids shall not cause a nuisance, as defined in CWC section 13050.

6. There shall be no discharge of biosolids from the storage or application areas to adjacent land areas not regulated by this General Order, to surface waters, or to surface water drainage courses.

7. From the permitted site, irrigation water runoff is prohibited for 30 days after application of biosolids if vegetation in the application area and along the path of runoff does not provide 33 feet of unmowed grass or similar vegetation to prevent the movement of biosolids from the application site.

8. Application of biosolids at rates in excess of the nitrogen requirements of the vegetation or at rates that would degrade ground water is prohibited except as allowed by Prohibition A.9.

9. Application of biosolids at rates in excess of the nitrogen requirements of the vegetation may be allowed for soil reclamation projects (as defined by land reclamation on page 4) as part of an overall plan for reclamation of sites (such as abandoned mine tailings and gravel quarries), provided the discharger can demonstrate that the application of excess nitrogen will not result in unacceptable degradation of underlying ground waters. A report prepared by a Certified Agronomist, Certified Soil Scientist, Registered Agricultural Engineer, or Registered Civil Engineer providing this demonstration shall be submitted to and approved by the RWQCB Executive Officer prior to the application of biosolids to reclamation sites at greater than agronomic rates.

10. The discharge of biosolids except as allowed for authorized storage, processing, and application sites is prohibited.

11. The application of "hazardous waste," as defined in Chapter 11, Division 4.5, Title 22 of the CCR, is prohibited.

12. Discharge of biosolids with pollutant concentrations greater than those shown below is prohibited.

	Ceiling Concentration
Constituent	mg/kg dry weight
Arsenic	75
Cadmium	85
Copper	4300
Lead	840
Mercury	57
Molybdenum	75
Nickel	420
Selenium	100
Zinc	7,500

13. The application of biosolids to water-saturated or frozen ground or during periods of precipitation that induces runoff from the permitted site is prohibited.

14. The application of Class B biosolids containing a moisture content of less than 50 percent is prohibited.

15. The application of biosolids in areas where biosolids are subject to gully erosion or washout off site is prohibited.

16. The application of biosolids to slopes exceeding 25 percent is prohibited.

B. DISCHARGE SPECIFICATIONS

1. All biosolids subject to this General Order shall comply with the applicable pathogen reduction standards listed in 40 CFR Part 503.32. In addition to those standards, all biosolids meeting Class A standards shall not have a maximum fecal coliform concentration greater than 1,000 most probable number (MPN) per gram of biosolids; or the density of salmonella, sp.[2] shall not be greater than three MPN per four grams.

2. All biosolids subject to this order shall comply with one of the applicable vector attraction reduction requirements specified in 40 CFR Part 503.33.

3. Biosolids application rates shall not exceed the agronomic rate for nitrogen for the crop being planted except as allowed by Prohibition No. 9 or for biosolids research projects.

4. Biosolids less than 75% moisture shall not be applied during periods when the surface wind speed exceeds 25 miles per hour as determined by the nearest calibrated regional weather station (e.g., airport, CIMS).

5. Biosolids shall not be applied in amounts exceeding the Risk Assessment Acceptable Soil Concentration as described below:

$$BC = RP - 1.8(BS)$$

Where: BC= Background Cumulative Adjusted Loading Rate (Lbs./Acre)
RP = 40 CFR Part 503 Cumulative Pollutant Loading Rate (Lbs./Acre)
BS = Actual Site Background Site Soil Concentration (mg/Kg)

And Where the Values for RP on a pollutant specific basis are given below:

Pollutant	Cumulative Pollutant Loading Rate (RP) (Lbs./Acre)
Arsenic	36
Cadmium	34
Copper	1336
Lead	267

[2] As determined by a USEPA approved method other than a method listed in "Standard Methods for the Examination of Water and Wastewater" 18th Edition, 1992, American Public Health Association, 1015 15th Street, NW., Washington, DC 2005; and other than the method found in Kenner, B. A. and H. P. Clark, "Detection and Enumeration of Salmonella and Pseudomonas aeruginosa," Journal of Water Pollution Control Federation, Vol. 46, No. 9, September 1974, pp. 2163-2171. Water Environment Federation, 601 Wythe Street, Alexandria, VA 22314.

Mercury	15
Molybdenum[3]	16
Nickel	374
Selenium	89
Zinc	2,494

6. If biosolids are applied to a site where the soil will be tilled, biosolids shall be incorporated within 24 hours after application in arid areas and in non-arid areas during the time period beginning May 1 and ending October 31 and within 48 hours in non-arid areas during the remaining time period.

7. Grazing of domesticated animals at sites where biosolids applications have occurred will be restricted until the necessary waiting period has elapsed. Such grazing shall be deferred for at least 60 days after application of biosolids in areas with average daily (daytime) air temperatures exceeding 50°F or be deferred for at least 90 days after land application where such conditions are not met.

8. If biosolids are applied to ground surfaces having a slope greater than ten percent (10%) or if required by the RWQCB Executive Officer, a report, including an erosion control plan, shall be prepared by a Certified Soil Scientist, Certified Agronomist, Registered Agricultural Engineer, Registered Civil Engineer, or a Certified Professional Erosion and Sediment Control Specialist and submitted to the RWQCB for approval with the NOI. This report shall describe the site conditions that justify application of biosolids to the steeper slopes and shall specify the application and management practices necessary (a) to assure containment of the biosolids on the application site and (b) to prevent soil erosion. The discharger shall comply with any approved erosion control plan submitted to the RWQCB.

9. Structures conveying tail water shall be designed and maintained to minimize any field erosion. Tail water structures shall be boarded and wrapped with plastic prior to any biosolids application but removed after biosolids incorporation into the soil.

10. Biosolids distinguished as "Class B" in 40 CFR Part 503 must comply with the following:

    a. The discharge of tail water or field runoff is prohibited within 30 days after application of biosolids for areas where biosolids have not been incorporated into the soil and where there is not a minimum of 33 feet[4] of unmowed grass or similar vegetation bordering the application area and along the path of runoff to prevent movement of biosolids particles from the application site.

    b. After an application of biosolids in any field, the discharger shall ensure the following:

[3] Currently the USEPA has not established a value for the limitation of molybdenum. Should the USEPA establish such a cumulative pollutant limitation in 40 CFR Part 503, that limit will preempt the limit specified for molybdenum.

[4] For sites where the topography slopes are greater than 10 percent, the minimum width of vegetative border shall be proposed in accordance to Discharge Specification No. 8 above.

(1) For at least 30 days:

(a) Food, feed, and fiber crops are not harvested.

(2) For at least 60 days after application of biosolids in areas with average daily (daytime) air temperatures exceeding 50°F or for at least 90 days after land application where such conditions are not met:

(a) Domesticated Animals are not grazed.

(3) For at least 12 months:

(a) Public access to the site is restricted for sites with a high potential for public exposure;
(b) Turf is not to be harvested if the harvested turf is placed on land with a high potential for contact by the public as defined in 40 CFR Part 503.11; and
(c) Grazing of milking animals used for producing unpasteurized milk for human consumption is prevented if the field is used as pasture.

(4) For at least 14 months:

Food crops with harvested parts that touch the biosolids/soil mixture and are totally above the land surface are not harvested.

(5) For at least 20 months:

Food crops with harvested parts below the land surface are not harvested when the biosolids remain exposed on the surface for four months or longer prior to incorporation.

(6) For at least 38 months:

Food crops with harvested parts below the land surface are not harvested when the biosolids remained exposed on the ground surface for less than four months prior to incorporation into the soil.

11. Staging and biosolids application areas shall be at least:

a. 10 feet from property lines[5],
b. 500 feet from domestic water supply wells[6],
c. 100 feet from non-domestic water supply wells[7],

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[5] This requirement may be waived when property lines are adjacent to properties also using biosolids as a soil amendment.

[6] A lesser setback distance from domestic water supply wells (not to be less than 100 feet) may be used if the discharger can demonstrate to the Executive Officer that the ground water, geologic, topographic, and well construction conditions at the specific site are adequate to protect the health of individuals using the supply well.

[7] A lesser setback distance (not to be less than 25 feet) may be used if the discharger can demonstrate to the RWQCB Executive Officer that the ground water, geologic, topographic, and well construction conditions at the specific site are adequate to protect the ground water. Not including agricultural drains.

d. 50 feet from public roads and occupied onsite residences,
e. 100 feet from surface waters, including wetlands, creeks, ponds, lakes, underground aqueducts, and marshes,
f. 33 feet from primary agricultural drainage ways,
g. 500 feet from occupied non-agricultural buildings and off-site residences[8],
h. 400 feet from a domestic water supply reservoir,
i. 200 feet from a primary tributary to a domestic water supply,
j. 2,500 feet from any domestic surface water supply intake, and
k. 500 feet from enclosed water bodies that could be occupied by pupfish.

12. Operators that produce land applied biosolids are to follow the recommendations contained in ISCORS's November 2003 draft report entitled "Assessment of Radioactivity in Sewage Sludge: Recommendations on Management of Radioactive Materials in Sewage Sludge and Ash in Publicly Owned Treatment Works" (ISCORS Technical Report 2003-04), for screening, identification, and consultation.

C. BIOSOLIDS STORAGE AND TRANSPORTATION SPECIFICATIONS

Biosolids shall be considered to be "stored" if they are placed on the ground or in non-mobile containers (i.e., not in a truck or trailer) at the application site or an intermediate storage location away from the generator/processing for more than 48 hours. Biosolids shall be considered to be "staged" if placed on the ground for brief periods of time solely to facilitate transfer of the biosolids between transportation and application vehicles.

1. Biosolids shall not be stored for more than seven (7) consecutive days prior to application.

2. Biosolids containing free liquids shall not be placed on the ground prior to application on an approved site, excluding equipment cleaning operations.

3. Biosolids shall not be stored directly on the ground at any one location for more than seven (7) consecutive days.

4. Sites for the storage of Class B biosolids shall be located, designed, and maintained to restrict public access to the biosolids.

5. Biosolids storage facilities that contain biosolids between October 1 and April 30 shall be designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.

6. Biosolids placed on site for more than 24 hours shall be covered.

7. Biosolids storage facilities shall be designed, maintained, and operated to minimize the generation of leachate and the effects of erosion.

[8] A lesser setback from non-agricultural buildings and off-site residences (not less than 100 feet) may be allowed by the Executive Officer provided that a lesser setback is not initially opposed by the current resident within 500 feet.

8. If biosolids are to be stored at the site, a plan describing the storage program and means of complying with this General Order shall be submitted for RWQCB Executive Officer approval with the NOI. The storage plan shall also include an adverse weather plan.

9. The discharger shall operate the biosolids storage facilities in accordance with the approved biosolids storage plan.

10. The discharger shall immediately remove and relocate any biosolids stored or applied on site in violation of this General Order.

11. All biosolids shall be transported in covered vehicles capable of containing the designated load.

12. No application of Class B biosolids shall be permitted within an area defined in the General Order as having a high potential for public exposure unless the biosolids are injected into the soil.

13. All biosolids having a water content that is capable of leaching liquids shall be transported in leak proof vehicles.

14. Each biosolids transport driver shall be trained as to the nature of its load and the proper response to accidents or spill events and shall carry a copy of an approved spill response plan.

15. The discharger shall avoid the use of haul routes near residential land uses to the extent possible. If the use of haul routes near residential land uses cannot be avoided, the discharger shall limit project-related truck traffic to daylight hours.

D. PROVISIONS

1. To obtain coverage under this General Order and terminate coverage thereof, the following must take place:

    a. Coverage:

        A complete NOI form and filing fee must be filed by the discharger for each proposed application site covered by these General WDRs. The NOI form may be modified by the RWQCB Executive Officer as the need arises. An NOI form is attached (Attachment A) to this General Order. Coverage does not begin until a Notice of Applicability has been issued by the applicable RWQCB's Executive Officer. No discharge shall occur until 15 days after submission of the Pre-Application Report as required in the Monitoring and Reporting Program.

    b. Coverage Termination:

        (1) A biosolids application project covered by these General WDRs may be terminated by submittal of the Final Monitoring and Reporting Program technical report and a NOT, as shown on

Attachment B of these General WDRs. The discharger(s) will be responsible for paying all annual fees for coverage under these General WDRs until approval of the NOT is granted by the RWQCB Executive Officer. For sites using Class B biosolids, termination shall not take place until 38 months after the last Class B biosolids application. The NOT form may be modified by the RWQCB Executive Officer as the need arises.

(2) If an individual WDR Order is issued to the discharger for a project covered by this General Order, the applicability of this General Order to the discharger is automatically terminated on the effective date of the individual WDR Order.

2. Where ground water monitoring is required, as specified by the RWQCB Executive Officer or as contained in Monitoring and Reporting Program, the ground water monitoring program must be in place prior to any application of biosolids.

3. A cultural resources investigation shall be conducted before any disturbance of land that has not been disturbed previously. The cultural resources investigation will include, at a minimum, a records search for previously identified cultural resources and previously conducted cultural resources investigations of the project parcel and vicinity. This record search will include, at a minimum, contacting the appropriate information center of the California Historical Resources Information System, operated under the auspices of the California Office of Historic Preservation. In coordination with the information center or a qualified archaeologist, a determination shall be made regarding whether previously identified cultural resources will be affected by the proposed project and if previously conducted investigations were performed to satisfy the requirements of CEQA. If not, a cultural resources survey shall be conducted. The purpose of this investigation will be to identify resources before they are affected by a proposed project and avoid the impact. If the impact is unavoidable, mitigation will be determined on a case-by-case basis, as warranted.

4. The Discharger shall comply with State laws regarding disposition of Native American burials if such remains are found. If human remains of Native American origin are discovered during project activities, the discharger shall comply with State laws relating to the disposition of Native American burials, which are under the jurisdiction of the Native American Heritage Commission (Pub. Res. Code Section 5097). If human remains are discovered or recognized in any location other than a dedicated cemetery (six or more human burials at one location constitute a cemetery [Section 8100], excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains will stop until:

   a. the county coroner has been informed of the discovery and has determined that no investigation of the cause of death is required; and

   b. if the remains are of Native American origin,

i. the descendants of the deceased Native Americans have made a recommendation to the landowner or the person responsible for the excavation work for means of treating or disposing of the human remains and any associated grave goods with appropriate dignity, as provided in Public Resources Code Section 5097.98, or

ii. the Native American Heritage Commission is unable to identify a descendant or the descendant failed to make a recommendation within 24 hours after being notified by the commission.

5. The discharger shall submit copies of each NOI to the appropriate regional office(s) of the Department of Fish and Game, local water district, City Planning Department, County Health Department(s), County Planning Department(s), and County Agricultural Commissioner(s) with jurisdiction over the proposed application site(s). Also, the discharger shall notify adjacent property owners with parcels abutting the subject land application site and, where applicable, tenants. The discharger shall submit proof to the RWQCB that all the above agencies and persons were notified. Other than compliance evaluations, the RWQCB is not responsible for the notification process. Regional Board staff will examine available records to determine if there are recorded wells at the proposed application site. No application will be permitted at the site unless the well has been properly abandoned or the set back requirements are observed.

6. The discharger shall comply with the Monitoring and Reporting Program No. 2000- which is part of this General Order and any plans required and contained within, and any revisions thereto.

7. The discharger must notify the RWQCB Executive Officer in writing at least 30 days in advance of any proposed transfer of this General Order's responsibility and coverage to a new discharger. The notice must include a new NOI for the proposed discharger, a NOT for the existing discharger, and a specific date for the transfer of this General Order's responsibility. This agreement shall include an acknowledgment that the existing discharger is liable for compliance with this General Order and for all violations up to the transfer date and that the new discharger is liable for compliance with this General Order and all violations after the transfer date.

8. Where the discharger becomes aware that it failed to submit any relevant facts in a NOI or submitted incorrect information in a NOI or in any report to the RWQCB, it shall promptly submit such facts or information.

9. The discharger shall be responsible for informing all biosolids transporters, appliers, and growers using the site of the conditions contained in this General Order.

10. The discharger must comply with all conditions of this General Order, including timely submittal of technical and monitoring reports as directed by the RWQCB Executive Officer. Violations may result in enforcement action, including RWQCB or court orders requiring corrective action or

imposing civil monetary liability or revision or rescission of the applicability of this General Order to a specific project.

11. Individuals and companies responsible for site operations retain primary responsibility for compliance with these requirements, including day-to-day operations and monitoring. Individual property owners and property managers retain primary responsibility for crop selection and any access or harvesting restrictions resulting from biosolids application. Individual owners of the real property at which the discharge will occur are ultimately responsible for ensuring compliance with these requirements. Enforcement actions for violations of this General Order may be taken against all dischargers required to comply with this General Order.

12. A copy of this General Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.

13. This General Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the discharger from his liability under federal, State, or local laws, nor do they create a vested right for the discharger to continue the waste discharge.

14. Provisions of these WDRs are severable. If any provision of these requirements is found invalid, the remainder of these requirements shall not be affected.

15. The SWRCB will review this General Order periodically and will revise requirements when necessary.

16. The discharger at all times shall properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with conditions of this General Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls, including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this General Order.

17. The discharger shall allow the RWQCB or an authorized representative upon the presentation of credentials, valid identification with photograph, and other documents as may be required by law to:

    a. Enter upon the discharger's premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this General Order;

    b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this General Order;

c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this General Order; and

d. Sample or monitor at reasonable times, any substances or parameters at any location for the purposes of assuring compliance with this General Order or as otherwise authorized by the CWC.

18. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All measurement devices shall be calibrated at least once per year or more frequently to ensure continued accuracy of the devices.

    Unless otherwise permitted by the RWQCB Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services. The RWQCB Executive Officer may allow use of any uncertified laboratory under exceptional circumstances, such as when the closest laboratory to the monitoring location is outside the State boundaries and therefore is not subject to certification. All analyses shall be conducted in accordance with those methods specified in 40 CFR Part 503.8(1) through 40 CFR Part 503.8(4), 40 CFR Part 503.8(6), and 40 CFR Part 503.8(7).

19. The discharger shall report any noncompliance which may endanger human health or the environment. Any such information shall be provided orally to the RWQCB Executive Officer within 24 hours from the time the discharger becomes aware of the circumstances. A written submission shall also be provided within five days of the time the discharger becomes aware of the circumstances. The written submission shall contain (a) a description of the noncompliance and its cause; (b) the period of noncompliance, including exact dates and times; and, (c) if the noncompliance has not been corrected, the anticipated time the noncompliance is expected to continue and steps being taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance with a time schedule that includes milestone dates. The RWQCB Executive Officer or an authorized representative may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. Also, the discharger shall notify the Office of Emergency Services (1-800-852-7550), the State Department of Health Services, Food and Drug Branch, (916) 445-2263), and the local health department as soon as practical but within 24 hours after the incident.

20. The discharger shall retain records of all monitoring information including all calibration and maintenance records for on-site monitoring equipment (if applicable), copies of all reports required by this General Order, and records of all data used to complete the application for this General Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the RWQCB Executive Officer.

    Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;
d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

21. All application reports or information to be submitted to the RWQCB Executive Officer shall be signed and certified as follows:

    a. For a corporation--by a principal executive officer or at least the level of vice president.
    b. For a partnership or sole proprietorship--by a general partner or the proprietor, respectively.
    c. For a municipality, State, federal, or other public agency--by either a principal executive officer or ranking elected official.

22. A duly authorized representative of a person designated in Provision No. 21 of this provision may sign documents if:

    a. The authorization is made in writing by a person described in Provision No. 21, above.
    b. The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and
    c. The written authorization is submitted to the RWQCB Executive Officer.

    Any person signing a document under these Provisions shall make the following certification:

    "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

CERTIFICATION

The undersigned, Clerk to the Board, does hereby certify that the foregoing is a full, true, and correct copy of an order duly and regularly adopted at a meeting of the State Water Resources Control Board held on July 22, 2004.

AYE: Arthur G. Baggett, Jr.
Peter S. Silva
Richard Katz
Gary M. Carlton
Nancy H. Sutley

NO: None.

ABSENT: None.

ABSTAIN: None.

Debbie Irvin
Clerk to the Board

Appendix G	Water Balance - 2014 2009 Biosolids Management Five Year Plan City of Porterville						
			Effluent Ponds				
Month	WW Flow (mg) (A)	WW Flow (ac-ft) (B)	Precip. Gains (ac-ft) (C)	Evap. Loss (ac-ft) (D)	Irrig Schedule (ac-ft) (E)	Percolation Required (ac-ft) (F)	
January	144.1	442.3	18.17	4.91	68	387.9	
February	130.6	400.9	17.22	8.69	107	302.4	
March	147.8	453.6	17.22	15.86	175	279.5	
April	148.7	456.4	9.57	22.28	261	183.2	
May	157.1	482.1	4.78	31.35	346	109.7	
June	154.7	474.9	0.96	36.26	440	0.0	
July	160.6	492.8	0.00	37.77	455	0.0	
August	161.3	495.0	0.00	32.10	463	0.0	
September	153.2	470.2	1.91	23.79	393	55.5	
October	152.1	466.8	4.78	16.62	225	229.6	
November	142.2	436.4	9.57	7.93	85	353.1	
December	138.6	425.4	15.30	3.78	51	386.0	
Total (Rounded)	**1,791**	**5,497**	**99**	**241**	**3,068**	**2,287**	
			Overall Annual Perc. Rate (ft/yr) =			**44**	
(A) Based on a wastewater flow (B) = (A)*3.069 (C) Based on 51.5 acres of percolation area (D) Based on 51.5 acres of percolation area. (E) Planned irrigation usage. Acres Irrigated = (F) = (B) + (C) - (D) - (E)			**Assuming no losses to evap.due to rapid infilitration, perc rate increases to:**			**49**	
					630		

CROP PLAN 2015 (Crop Year)		
Field	**Acres**	**2011**
Reclamation/Dry Farmed Areas		(Nov 2014 - Oct 2015)
5N	20	Alfalfa
7	34	Alfalfa
8	18	Alfalfa
9	14	Alfalfa
10	32	Alfalfa
27	31	Alfalfa
28B	19	Alfalfa
29	38	Alfalfa
32	57	Alfalfa
46A	30	Alfalfa
160C	40	Alfalfa
Total	**333**	
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
28A	14	Oat Hay/Fallow
46B	17	Oat Hay/Fallow
Total	**281**	
30	43	Oat Hay/Sudan
31	23	Oat Hay/Sudan
33	8	Oat Hay/Sudan
34	21	Oat Hay/Sudan
Total	**95**	
5S	20	Cotton
35	31	Cotton
160A	40	Cotton
160B	40	Cotton
160D	40	Cotton
Total	**171**	
Grand Total	**880**	
Dry-Farmed Area		
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
Total	**250**	
Grand Total	**250**	

4. Copy of General Order, Biosolids Utilization

Carollo
Engineers...Working Wonders With Water

September 23, 2010
6015N00

City of Porterville
Wastewater Treatment Plant
555 N. Prospect
Porterville, California 93258

Attention: Mr. Robert Alvarez, Wastewater Superintendent

Subject: City of Porterville - 2010 Biosolids Management Five-Year Plan

Dear Mr. Alvarez:

Enclosed is the 2010 Biosolids Management Five-Year Plan (BMP) prepared for the City of Porterville (City) Wastewater Treatment Plant (WWTP). The report is intended as an update of the 2009 BMP, and provides an operational plan to land apply effluent and biosolids on the City's reclamation lands and apply biosolids on the City's dry farmed areas. Biosolids can only be applied on the fields incorporated into the City limits.

An update to the 2009 BMP was needed to accommodate minor changes in the City's biosolids management practices. The City's goal, as exemplified by the 2009 BMP, is to land apply the WWTP's entire annual production of biosolids every year following solar drying, and to balance the land use between effluent and biosolids applications to stay within agronomic loading rates. An additional goal of the 2010 BMP is to maximize the amount of biosolids applied to the reclamation area, as opposed to the dry farmed area, to maximize the benefits of biosolids on increased agricultural production.

The report includes water and nitrogen balance calculations for five years (2011 through 2015) of projected WWTP flows. The five-year plan is designed to rotate the fields receiving biosolids, so that at least three years elapse before applying biosolids again. However, in order to maximize the benefits of biosolids application to the soil, the new cropping plan includes several exceptions to the rotation scheme. In order to maintain agronomic loading rates, the mineralized nitrogen from the biosolids application must be accounted for when determining the appropriate biosolids application rates for subsequent years. Mineralized nitrogen calculations for applicable fields in the new cropping plan are also included in the BMP.

Based on water and nitrogen balance calculations, Carollo Engineers, Inc. (Carollo) concludes the City has adequate land, for the next five years, to apply biosolids and effluent at agronomic rates with low hydraulic loading rates to the percolation ponds. The land in the reclamation and dry farmed areas provide greater capacity for biosolids over the quantity projected. This should provide the City flexibility in planning future cropping schedules.

The report is for the City's internal use only, and does not need to be submitted to California Department of Public Health (CDPH) or the RWQCB.

7580 N. Ingram Avenue, Suite. 112, Fresno, California 93711
P. 559.436.6616 F. 559.436.1191

We appreciate the opportunity to assist the City of Porterville with this project. If you have any further questions feel free to call us at 559.436.6616.

Sincerely,

CAROLLO ENGINEERS, P.C.

Amando Garza, P.E.
Partner

Eric Casares, P.E.

AGG/ETC:asw

Enclosures: 2009 Biosolids Management Five-Year Plan

2010 BIOSOLIDS MANAGEMENT FIVE-YEAR PLAN

1.0 PURPOSE

The purpose of the 2010 Biosolids Management Five-Year Plan (BMP) is to provide the City of Porterville (City) Wastewater Treatment Plant (WWTP) with an operational plan to land apply biosolids on the City's reclamation and dry farmed areas. The objective is to apply biosolids within the guidelines and requirements of the State Water Resources Control Board (SWRCB) Water Quality Order 2004-12-DWQ (General Order) and the Code of Federal Regulations Title 40, Part 503 (40 CFR 503). Biosolids can only be applied on the fields incorporated in the City limits.

The original BMP was completed in April 2007 (2007 BMP). A revised BMP was prepared in August 2009 (2009 BMP) to accommodate several significant changes to the City's biosolids management practices including:

- Application of biosolids to City-owned dry farmed parcels; and
- Effluent irrigation of fields receiving biosolids during the first year of biosolids application.

During the preparation of the 2009 BMP, the City contracted with a new company, Perrigo Roadsiding (Perrigo), to farm the City-owned reclamation area. The City utilizes the reclamation area to reuse treated effluent from the WWTP. A new iteration of the BMP is now required to accommodate several operational issues discovered by Perrigo during the first year of managing the reclamation area as well as a revised cropping schedule. The City's goal, as exemplified by the 2009 BMP, is to land apply the WWTP's entire annual production of biosolids every year following solar drying, and to balance the land use between effluent and biosolids applications to stay within agronomic loading rates. An additional goal of the 2010 BMP is to maximize the amount of biosolids applied to the reclamation area, as opposed to the dry farmed area, to maximize the benefits of biosolids on increased agricultural production. The effluent and biosolids both contain beneficial nutrients for the crops. The biosolids also rejuvenate the soil, providing an added benefit.

The conclusions of the 2010 BMP are consistent with previous iterations of the BMP in that the City has adequate land to apply biosolids and effluent with the use of both the reclamation and dry farmed areas. The City can also apply biosolids and irrigate land with effluent in the first year of biosolids application, and remain within agronomic loading rates, and low hydraulic loading rates to the ponds with careful management. While the reclamation area will be given priority for biosolids application, the dry farmed area will be used to augment the City's capacity when required.

2.0 RECLAMATION SITE

Figure 1 shows the land within the WWTP reclamation and dry farmed areas. Fields that will receive biosolids and/or effluent are also identified. All fields are owned by the City of Porterville.

There are a total of 880 acres available for biosolids application. A total of 630 acres are located within the reclamation area. The remaining 250 acres are located in the City-owned dry farmed area. Biosolids will be applied at agronomic loading rates on land located within the reclamation area as well as the dry farmed areas. Fields located in the reclamation area that receive biosolids will be irrigated with WWTP effluent during the first year the biosolids are applied. Therefore, a total of 630 acres is available for effluent irrigation for every year in the five-year planning horizon.

3.0 CROPS

The revised five-year cropping schedule is shown in Appendix A. The schedule is the result of collaborative effort between the City, Perrigo, and Carollo Engineers, Inc. (Carollo). The crop schedule is intended to maximize the effluent disposal and biosolids application capacity of the City's land while accommodating an effective farming operation. The schedule is based on the crop irrigation demand, assumed 70 percent irrigation efficiency, and established values for crop nitrogen requirements. Historically, the crops grown at the reclamation site are alfalfa, sudan grass (sudan), and oat hay. Since 2009, cotton has also been grown on the reclamation area. The nitrogen requirements for these crops are listed below.

- Alfalfa = 480 pounds/acre
- Sudan Grass = 325 pounds/acre
- Cotton = 175 pounds/acre
- Oat Hay = 115 pounds/acre
- Double Cropped with oat hay and sudan grass = 440 pounds/acre

As part of the 2009 BMP, a memorandum was prepared by Richard B. Smith of RBSmith Consulting describing the nitrogen requirements of dry farmed oat hay. Based on the recommendations included in this memorandum (Appendix A), the nitrogen requirements for dry farmed oat hay is 60 pounds/acre. This figure was used to determine agronomic biosolids application rates for the dry farmed fields.

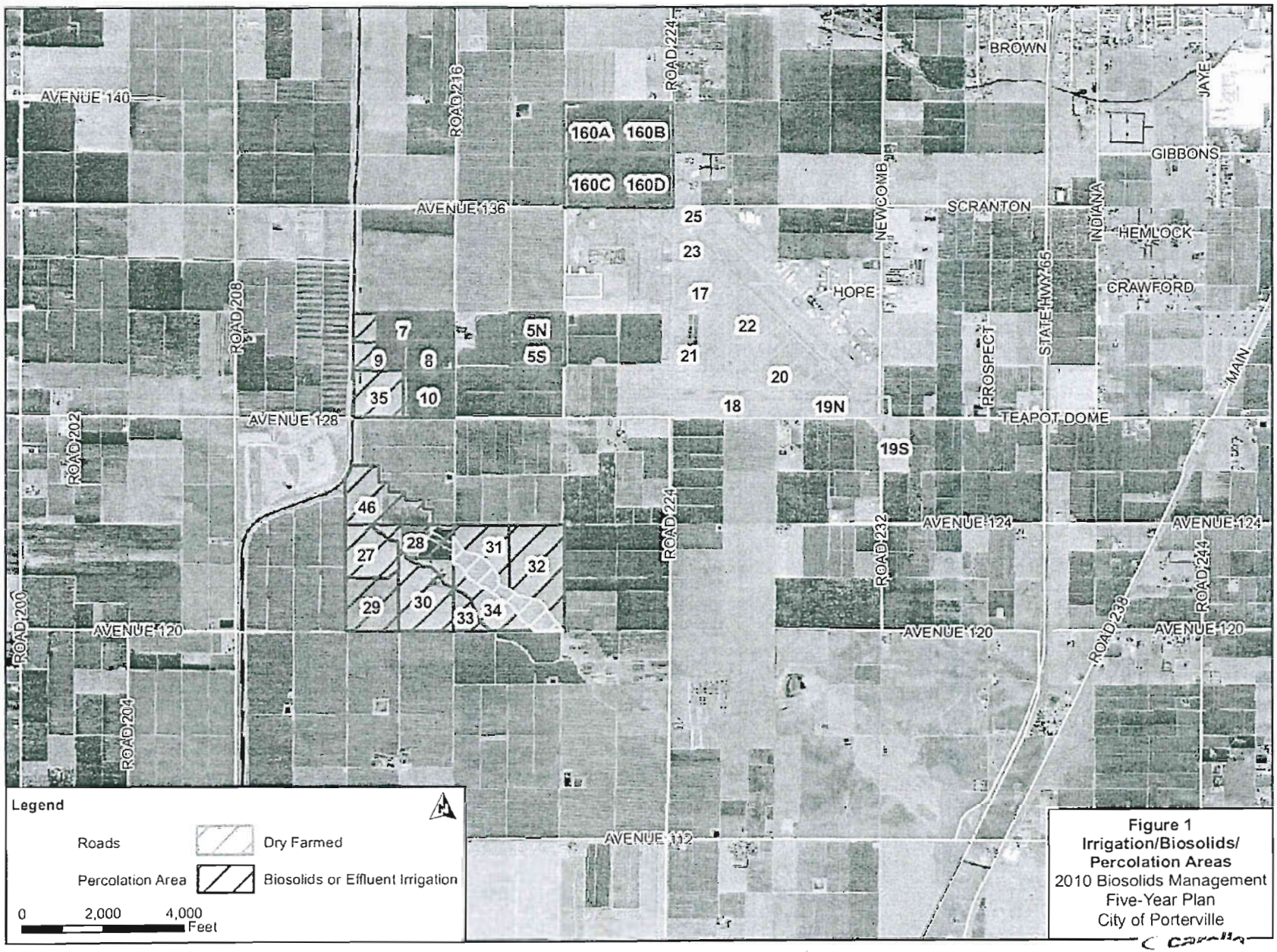

Figure 1
Irrigation/Biosolids/
Percolation Areas
2010 Biosolids Management
Five-Year Plan
City of Porterville

4.0 BIOSOLIDS QUANTITY AND QUALITY

Biosolids are solar dried in the soil-cement lined drying beds adjacent to the reclamation area. The biosolids are stockpiled in the drying beds until it is time for spreading.

The WWTP currently produces approximately 1,050 tons of biosolids annually. Assuming a 1.0 percent annual growth rate for the City's wastewater flows, the production will increase to 1,130 tons in 2015. These projections are summarized in Appendix B. Biosolids production will be less than the estimated capacity of the reclamation and dry farmed areas. Based on agronomic loading calculations, the estimated capacity for each year in the five-year planning period is also shown in Appendix B.

The biosolids meet the 40 CFR 503 requirements for Class B pathogen reduction by solar drying for 90 days, and the vector attraction reduction requirement is met by anaerobic digestion followed by solar drying to a minimum 75 percent total solids.

Metals and nutrient concentrations are provided in Appendix B. The metals concentrations of the City's biosolids comply with the requirements for exceptional quality in accordance with the 40 CFR 503 regulations (Appendix B).

5.0 EFFLUENT QUANTITY AND QUALITY

The effluent flows averaged 4.62 mgd in 2009. Assuming a 1.0 percent growth rate, the effluent flows will increase to 4.91 mgd at the end of the five-year planning period, which can be seen in Appendix B.

The effluent total nitrogen concentration averaged 18.7 mg/L in 2005. This concentration was assumed for all calculations in this report.

6.0 PERCOLATION POND AREA

The WWTP's percolation area covers approximately 52 acres. The area is shown in Figure 1. For the water balances, hydraulic loading rates are all below 42 feet/year in the percolation area, even at the projected flow of 4.91 MGD in the year 2015.

7.0 FIVE-YEAR OPERATIONAL PLAN

7.1 Crop Schedule

Appendix A contains the agronomist's reports and the anticipated cropping schedule for the fields that are to receive either biosolids or biosolids and effluent for the next five years. The crop schedule is the City's best estimate at this time, and some changes or adjustments may occur over the course of the five-year plan. This is to be expected, however the overall

objective will be to maximize the reuse potential for effluent and biosolids, while staying below the nitrogen limits for the crops.

The revised cropping schedule proposed in the 2009 BMP was an extension of the cropping schedule developed in the original BMP. After meeting with Perrigo, Carollo has incorporated their recommendations into the new cropping schedule. Carollo has also employed the same general approach to develop the new cropping schedule as was used to develop previous iterations of the cropping schedule. The main tenant of this approach is to maximize the reuse and biosolids application potential of the City's land.

Based on the lack of irrigation available at the dry farmed areas, this land will be planted in oat hay and left fallow in the second half of the crop year for the entire five-year planning period. As noted previously, the nitrogen requirement for dry farmed oat hay differs from oat hay grown in the reclamation area that is irrigated with effluent.

7.2 Biosolids Application

Historically, the five-year plan was designed to rotate the fields receiving biosolids so that at least three years elapsed before applying biosolids again. The rotation allows time for any residual organic nitrogen from the biosolids to be mineralized and used by the crops before reapplication. The benefit to this approach is that the WWTP will not have to account for the residual organic nitrogen when calculating the agronomic loading rate for the biosolids. However, in order to maximize the benefits of biosolids application to the soil, the new cropping plan includes several exceptions to the rotation scheme. Specifically, Perrigo has requested fields going into their first year of alfalfa receive biosolids in the same year. For example, the soil and sludge mixture stockpiled at the WWTP was applied to Field 30 in 2010. Since the field is going into alfalfa in 2011, Field 30 has been slated to receive biosolids in October/November 2010. In order to maintain agronomic loading rates, the mineralized nitrogen from the soil and sludge mixture application must be accounted for when determining the appropriate biosolids application rate for this field in 2011. Mineralized nitrogen calculations for Field 30, as well as other fields affected by mineralized nitrogen in the new cropping plan, are included in Appendix B.

A second benefit of the rotation approach is that the site lifetime is extended, in regards to the accumulation of metals in the soil. The General Order includes cumulative loading limits for metals that are based on background site soil concentrations. Appendix B provides an example calculation using the current metal concentrations in the biosolids and the overall average soil concentration, and an application rate of 26 tons/acre on alfalfa. The City will need to track cumulative loadings on each individual field, periodically to compare against the limits.

The calculations illustrate, with this type of rotation, the most limiting metal is molybdenum, and fields would need to be removed from the biosolids program in 29 years. This will vary for each field, but provides a general timeframe. The City has options to extend the duration

for each field even further, by applying biosolids at lower loading rates or extending the rotation period. These options are feasible, since the site has greater capacity than what is needed during the five-year planning period (see Appendix B).

As part of the 2010 BMP, background site soil concentrations for metals for the dry farmed areas were determined. The calculations (Appendix B) illustrate, with the rotation scheme, the most limiting metal is zinc, and the dry farmed area would need to be removed from the biosolids program in 131 years. Like previously completed calculations for the reclamation area, this will vary for each field within the dry farmed area, but provides a general timeframe.

It is important to note that deviations from the rotation scheme will be done infrequently to accommodate special circumstances. The five-year biosolids application schedule included in the updated BMP utilizes all the fields in both the reclamation and dry farmed area like previous iterations of the BMP.

For all years, the schedule will be to apply biosolids in October to fields that will be seeded in alfalfa, cotton, oat hay, or double cropped with oat hay and sudan. Alfalfa, Cotton, and oat hay will be seeded in November. The oat hay will be harvested in May. Sudan will be seeded in June and harvested in October. The alfalfa will be maintained as a four-year crop. At the end of the fourth year, the alfalfa crop will be removed and either cotton or oat hay will be planted.

The concentration of plant available nitrogen (PAN) in the biosolids is estimated at 18.33 lbs/ton (dry basis) based on biosolids testing done in 2009. This concentration was used to estimate allowable loading rates, which are provided in Appendix B.

Based on 18.33 lbs/ton PAN, biosolids application rates were calculated for the various crops grown on the reclamation and dry farmed areas. The individual biosolids application rates are listed below.

- Alfalfa = 26.2 tons/acre
- Sudan Grass/Oat Hay = 24.0 tons/acre
- Cotton = 9.5 tons/acre
- Oat Hay = 6.3 tons/acre
- Oat Hay (Dry Farmed) = 3.3 tons/acre

These amounts may change from year to year, depending on biosolids quantity, PAN concentrations, and the sizes of the fields to be used. The WWTP will need to verify the PAN each year prior to land application to confirm the allowable loading rate.

It is also important to note that all of the fields receiving biosolids, with the exception of the dry farmed fields, will be irrigated by effluent the same year biosolids are applied. Therefore, the actual biosolids loading rates will be significantly less than those listed above when accounting for the nitrogen contribution from the effluent. Biosolids loading rates were calculated using an effluent total nitrogen concentration of 18.7 mg/l and the crop irrigation demands referenced from the agronomists' reports. These loading rates were calculated assuming no mineralized nitrogen contribution from previous applications. The individual biosolids application rates are listed below.

- Alfalfa = 9.1 tons/acre
- Sudan Grass/Oat Hay = 8.5 tons/acre
- Cotton = 1.4 tons/acre
- Oat Hay = 0.7 tons/acre
- Oat Hay (Dry Farmed) = 3.3 tons/acre

As an alternative means of biosolids disposal, the City has negotiated with a licensed hauler and land applier to have biosolids removed from the WWTP site. The City currently contracts with Liberty Composting to haul biosolids offsite for further treatment and disposal as required. The cost for this type of disposal is $45/ton. For the anticipated biosolids production in 2011 (1,050 dry tons), hauling from the WWTP would cost the City approximately $53,000 annually. This cost should be weighed against the cost for spreading biosolids on the reclamation and dry farmed areas as well as the fertilizer cost that is offset by the nutrients in the biosolids that benefit the City-owned land.

7.3 Effluent Irrigation

The five-year operation plan for effluent irrigation is based on:

- 70 percent irrigation efficiency;
- Maintaining agronomic loading rates for nitrogen; and
- Maintaining hydraulic loading rates to the ponds below 150 feet/year.

Effluent will be applied to every field, with the exception of the dry farmed area, even if a field has received biosolids during that year. The average total nitrogen concentration in the effluent was 18.7 mg/L in 2005. This concentration was used in all calculations presented herein. Water and nitrogen balance calculations assume an irrigation efficiency of 70 percent. They are provided in Appendices C through G for years 2011 through 2015. The evaporation and precipitation estimates that were used for preparation of all the water balance calculations are listed in Appendix B.

7.4 Year 2010 Biosolids Application

The City will submit an addendum to the Notice of Intent (NOI) form for land application of biosolids to the Regional Water Quality Control Board (RWQCB). The addendum will include information on several fields in the reclamation area that will now receive biosolids including Fields 28A, 28B, 34, 46A, 46B, 160A, 160B, 160C, and 160D. The City will submit the Pre-application form for land applying biosolids to Fields 5S, 8, 30, 31, 33, 34, and 35.

Biosolids will be applied to Fields 5S (alfalfa), 8 (oat hay/sudan), 30 (alfalfa), 31 (alfalfa), 33 (alfalfa), 34 (alfalfa), and 35 (alfalfa) in October/November 2010. These fields total 164 acres and provide sufficient land needed to apply 1,427 tons of biosolids at agronomic rates with irrigation of Fields 5S, 8, 30, 31, 33, 34, and 35 with WWTP effluent (see Appendix B). If these fields are irrigated with a supplemental irrigation water source, the 164 acres provide sufficient land to apply 4,255 tons of biosolids at agronomic rates. The total nitrogen requirements, biosolids application rates, and the amount of biosolids that can be applied on each field are listed in Appendix B.

7.5 Year 2011 Effluent Irrigation (Nov 2010 - Oct 2011)

Effluent will be applied to every field in the reclamation area including those receiving biosolids in October/November 2010. Thus, in 2011, effluent will be applied on 630 acres of irrigable farmland.

Water and nitrogen balances are calculated for a projected flow of 4.71 MGD (assuming a 1.0 percent growth per year) in 2011 and 630 acres of effluent irrigation farmland. The cropping schedule for 2011 is included in Appendix C. Based on the water and nitrogen balance in Appendix C, the City has adequate land to apply biosolids and effluent and remain within agronomic loading rates. The hydraulic loading rates to the ponds are calculated to be 37 feet/year.

7.6 Year 2011 Biosolids Application

The City will submit the Pre-application form for land applying biosolids to Fields 5N, 46A, 160A, 160B, and 160C to the RWQCB.

Biosolids will be applied to Fields 5N (alfalfa), 46A (alfalfa), 160A (oat hay/sudan), 160B (oat hay/sudan), and 160C (oat hay/sudan) in October/November 2011. These fields total 170 acres and provide sufficient land to apply 1,498 tons of biosolids at agronomic rates with irrigation of Fields 5N, 46A, 160A, 160B, and 160C with WWTP effluent. If these fields are irrigated with a supplemental irrigation water source, the 170 acres provide sufficient land to apply 4,277 tons of biosolids at agronomic rates. The total nitrogen requirements, biosolids application rates, and the tons of biosolids that can be applied on each field are listed in Appendix B.

7.7 Year 2012 Effluent Irrigation (Nov 2011 - Oct 2012)

Effluent will be applied to every field in the reclamation area including those receiving biosolids in October/November 2011. Thus, in 2012, effluent will be applied on 630 acres of irrigable farmland.

Water and nitrogen balances are calculated for a projected flow of 4.76 MGD in 2012 and 630 acres of effluent irrigation farmland. The cropping schedule for the 2012 season is included in Appendix D. Based on the water and nitrogen balance in Appendix D, the City has adequate land to apply biosolids and effluent and remain within agronomic loading rates, using 70 percent irrigation efficiency. The hydraulic loading rates to the ponds are calculated to be 39 feet/year.

7.8 Year 2012 Biosolids Application

The City will submit the Pre-application form for land applying biosolids to Fields 7, 9, 10, 18, 19N, 19S, 20, 21, 22, and 28B to the RWQCB.

Biosolids will be applied to Fields 7 (oat hay/sudan), 9 (oat hay/sudan), 10 (oat hay/sudan), 18 (oat hay), 19N (oat hay), 19S (oat hay), 20 (oat hay), 21 (oat hay), 22 (oat hay), and 28B (alfalfa) in October/November 2012. These fields total 274 acres and provide sufficient land to apply 1,426 tons of biosolids at agronomic rates with irrigation of Fields 7, 9, 10, and 28B with WWTP effluent. If these fields are irrigated with a supplemental irrigation water source, the 274 acres provide sufficient land to apply 2,991 tons of biosolids at agronomic rates. Fields 18, 19N, 19S, 20, 21, and 22 are part of the dry farmed area and do not receive effluent irrigation. The total nitrogen requirements, biosolids application rates, and the amount of biosolids that can be applied on each field are listed in Appendix B.

7.9 Year 2013 Effluent Irrigation (Nov 2012 - Oct 2013)

Effluent will be applied to every field in the reclamation area including those receiving biosolids in October/November 2012. Thus, in 2013, effluent will be applied on 630 acres of irrigable farmland.

Water and nitrogen balances are calculated for a projected flow of 4.81 MGD in 2013 and 630 acres of effluent irrigation farmland. The cropping schedule for the 2013 season is included in Appendix E. Based on the water and nitrogen balance in Appendix E, the City has adequate land to apply biosolids and effluent and remain within agronomic loading rates, using 70 percent irrigation efficiency. The hydraulic loading rates to the ponds are calculated to be 41 feet/year.

7.10 Year 2013 Biosolids Application

The City will submit the Pre-application form for land applying biosolids to Fields 7, 8, 9, 10, 23, 25, 160B, and 160D to the RWQCB.

Biosolids will be applied to Fields 7 (alfalfa), 8 (alfalfa), 9 (alfalfa), 10 (alfalfa), 23 (oat hay), 25 (oat hay), 160B (oat hay/sudan), and 160D (oat hay/sudan grass) in October/November 2013. These fields total 213 acres and provide sufficient land for application of 1,422 tons of biosolids at agronomic loading rates with irrigation of Fields 7, 8, 9, 10, 160B, and 160D with WWTP effluent. If these fields are irrigated with a supplemental irrigation water source, the 213 acres provide sufficient land to apply 4,601 tons of biosolids at agronomic rates. Fields 23 and 25 are part of the dry farmed area and do not receive effluent irrigation. The total nitrogen requirements, biosolids application rates, and the amount of biosolids that can be applied on each field are listed in Appendix B.

7.11 Year 2014 Effluent Irrigation (Nov 2013 - Oct 2014)

Effluent will be applied to every field in the reclamation area including those receiving biosolids in October/November 2013. Thus, in 2014, effluent will be applied on 630 acres of irrigable farmland.

Water and nitrogen balances are calculated for a projected flow of 4.86 MGD in 2014 and 630 acres of effluent irrigation farmland. The cropping schedule for the 2014 growing season is included in Appendix F. Based on the water and nitrogen balance in Appendix F, the City has adequate land to apply biosolids and effluent and remain within agronomic loading rates, using 70 percent irrigation efficiency. The hydraulic loading rates to the ponds are calculated to be 40 feet/year.

7.12 Year 2014 Biosolids Application

The City will submit the Pre-application form for land applying biosolids to Fields 17, 20, 21, 27, 29, and 32 to the RWQCB.

Biosolids will be applied to Fields 17 (oat hay), 20 (oat hay), 21 (oat hay), 27 (alfalfa), 29 (alfalfa), and 32 (alfalfa) in October/November 2014. These fields total 251 acres and provide sufficient land to apply 1,513 tons of biosolids at agronomic rates with irrigation of Field 27, 29, and 32 with WWTP effluent. If these fields are irrigated with a supplemental irrigation water source, the 251 acres provide sufficient land to apply 1,513 tons of biosolids at agronomic rates. Fields 17, 20, and 21 are part of the dry farmed area and do not receive effluent irrigation. The total nitrogen requirements, biosolids application rates, and the tons of biosolids that can be applied on each field are listed in Appendix B.

7.13 Year 2015 Effluent Irrigation (Nov 2014- Oct 2015)

Effluent will be applied to every field in the reclamation area including those receiving biosolids in October/November 2014. Thus, in 2015, effluent will be applied on 630 acres of irrigable farmland.

Water and nitrogen balances are calculated for a projected flow of 4.91 MGD in 2015 and 630 acres of farmland irrigated with farmland. The cropping schedule for the 2015 growing

season is included in Appendix G. Based on the water and nitrogen balances in Appendix G, the City has adequate land to apply biosolids and effluent and remain within agronomic loading rates. The hydraulic loading rates to the ponds are calculated to be 44 feet/year.

8.0 SUMMARY

In summary, water and nitrogen balance calculations for five years (2011 to 2015) indicate the City has adequate land to apply biosolids and effluent at agronomic rates and low hydraulic loading rates to the ponds. The 2010 BMP also shows that the land in the reclamation area and the dry farmed area provides greater capacity for biosolids over the quantity projected, even when land receiving biosolids is irrigated with WWTP effluent. This is a benefit, as it should provide the City flexibility in planning future cropping schedules. A summary of the anticipated irrigation and biosolids management practices for the next five crop years is shown in Table 1.

Table 1 Irrigation and Biosolids Application Summary
2010 Biosolids Management Five3 Year Plan
City of Porterville

Year	Crop Year	Wastewater Flows[1] (mgd)	Wastewater Flows[1] (AF/yr)	Reclamation Area (acres)	Irrigation Requirements (AF/yr)	Percolation Requirements (AF/yr)	Percolation Rates (feet/year)	Biosolids Production (tons)	Application Area (acres)	Available Capacity[2] (tons)
2011	Nov. 2010 – Oct. 2011	4.71	5,282	630	3,232	1,909	37	1,050	164	1,427
2012	Nov. 2011 – Oct. 2012	4.76	5,335	630	3,195	7,998	39	1,070	170	1,498
2013	Nov. 2012 – Oct. 2013	4.81	5,388	630	3,158	2,089	41	1,090	274	1,426
2014	Nov. 2013 – Oct. 2014	4.86	5,442	630	3,257	2,044	40	1,110	213	1,422
2015	Nov. 2014 – Oct. 2015	4.91	5,497	630	3,068	2,287	44	1,130	251	1,513

Notes:

1. Projected wastewater flows based on 2009 average annual flows and a 1.0 percent growth rate
2. Available capacity based on agronomic loading rates.

FIVE YEAR PLAN - PRELIMINARY CROPPING SCHEDULE

Field	Acres	2011	2012	2013	2014	2015
		(Nov 2010 - Oct 2011)	(Nov 2011 - Oct 2012)	(Nov 2012 - Oct 2013)	(Nov 2013 - Oct 2014)	(Nov 2014 - Oct 2015)
5N	20	Cotton	Alfalfa	Alfalfa	Alfalfa	Alfalfa
5S	20	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Cotton
7	34	Oat Hay/Sudan	Cotton	Oat Hay/Sudan	Alfalfa	Alfalfa
8	18	Oat Hay/Sudan	Cotton	Oat Hay/Sudan	Alfalfa	Alfalfa
9	14	Oat Hay/Sudan	Cotton	Oat Hay/Sudan	Alfalfa	Alfalfa
10	32	Oat Hay/Sudan	Cotton	Oat Hay/Sudan	Alfalfa	Alfalfa
17	40	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
18	20	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
19N	20	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
19S	20	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
20	53	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
21	32	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
22	30	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
23	20	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
25	15	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
27	31	Alfalfa	Alfalfa	Alfalfa	Cotton	Alfalfa
28A	14	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
28B	19	Cotton	Oat Hay/Sudan	Alfalfa	Alfalfa	Alfalfa
29	38	Alfalfa	Alfalfa	Alfalfa	Cotton	Alfalfa
30	43	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Oat Hay/Sudan
31	23	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Oat Hay/Sudan
32	57	Alfalfa	Alfalfa	Alfalfa	Oat Hay/Sudan	Alfalfa
33	8	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Oat Hay/Sudan
34	21	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Oat Hay/Sudan
35	31	Alfalfa	Alfalfa	Alfalfa	Alfalfa	Cotton
46A	30	Cotton	Alfalfa	Alfalfa	Alfalfa	Alfalfa
46B	17	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow	Oat Hay/Fallow
160A	40	Alfalfa	Oat Hay/Sudan	Cotton	Oat Hay/Sudan	Cotton
160B	40	Alfalfa	Oat Hay/Sudan	Cotton	Oat Hay/Sudan	Cotton
160C	40	Oat Hay/Sudan	Alfalfa	Alfalfa	Alfalfa	Alfalfa
160D	40	Alfalfa	Alfalfa	Cotton	Oat Hay/Sudan	Cotton
Total	**880**					

Alfalfa
Cotton
Oat Hay/Sudan
Oat Hay/Fallow

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February 23, 2007

Penny Carlo
Carollo Engineers
7580 North Ingram Avenue, Suite 112
Fresno, CA 93711

Dear Penny,

Agronomist Report on City of Porterville Biosolids Application Area

I have reviewed the soils data from 2001 to the most recent samples from January 2007 from most fields of the farming operation. I will discuss the results in general and then look at individual fields.

In general, the soils data indicate the overall salinity levels of most fields have improved with lower Electrical Conductivity (EC) levels. It would appear that most of the salinity improvement has come as a result of leaching of the soluble Calcium out of the analyzed zone. Most Calcium levels are lower in recent years than the earlier samples. Sulfate levels are also lower indicating that the leached salts were Calcium Sulfate or gypsum. With the reduction in salinity and especially the Calcium and Sulfate fractions of that salinity it is showing an increase in Exchangeable Sodium Percentage (ESP). Exchangeable Sodium Percentage levels above 5 are considered a potential water penetration problem. Most fields are there and/or moving in that direction and correction should take place before significant water penetration problems occur. Most pH levels are within the normal range of agronomic conditions.

The Cation Exchange Capacity (CEC) is a measurement of the soils ability to exchange nutrients (cations) and is an indication as to the inherit fertility of the soil. The lower the CEC, the lower the fertility of the soil and conversely the higher the CEC, the higher the inherit fertility of the soil. The CEC is a function of the humus or organic matter, and the clay content of the soil. It is difficult the change the CEC very much.

The nutritional aspects of the farm in general can be summarized as low in Potassium, getting lower in Phosphorus, and varying in nitrate levels from adequate to low. The analysis from the dry farmed fields do not appear to show dangerously high levels of any of the elements reported, most are quite low.

The following paragraphs will address each field with data.

Field 5 – The EC levels have gone from a high of 3.85 in 12/2001 to a level of 0.96 in 8/2006. This is a good reduction and will allow this field to grow most plants without restrictions due to salinity. The Calcium levels have also dropped from 20.6 meq/L in 12/2001 to 2.6 meq/L in 8/2006. This level is too low and should have some gypsum applied to the field at the rate of 2.0 tons per acre. This will also improve the low level of SO_4S. Although Sodium levels have actually gone down over the years they have become the dominant soluble salt resulting in the ESP increasing above the 5.0 level at which water penetration problems begin to increase due to the imbalance of Calcium and Sodium in the soil. Nitrate levels have fluctuated over the years but have been in the low to moderate range. Phosphorus levels have also fluctuated over the years ranging from low to adequate. Potassium levels have been low in all years except the first year of sampling, 2001. Additional Potassium should be added in the range of 200 to 300 pounds of K_2O per acre. Zinc levels are mixed, the north part of the field is always showing good Zinc levels, however, the south half shows low Zinc levels except for the first sample in 2001. Five pounds of actual Zinc per acre should be adequate. The other aspects of the analysis are within normal ranges and should be satisfactory.

Field 6 – The EC levels have gone down slightly except for one spike to 4.90 back in 12/2001. The other levels have been less than 2 and most recently less than 1.00. Calcium levels are also low except for that one sample and Sodium levels have been the dominant salt in each sample except for that one sample in 12/2001. ESP has been relatively stable with a slight increase developing over the years and now has actually gone over 6 at 6.1. The use of gypsum will increase the soluble Calcium and reduce the ESP. I would recommend at least 2.0 tons per acre of gypsum applied per acre. Nitrate levels have fluctuated over the years from quite high to low. The last three years sample has shown low nitrate levels. Phosphorus levels are high and have been coming down over the years. There are still adequate Phosphorus levels in this field for most agronomic crops. Potassium levels are low and have remained low except for one sample in 12/2001. I would suggest Potassium be added at the rate of 200 to 300 pounds per acre of K_2O. All other aspects of the analysis are okay.

Field 7 – The EC levels have decreased from over 2 to about 1.0. The soluble Calcium has dropped from 10.5 meq/L in 12/2001 to 2.4 meq/L in the 9/2006 sample. The ESP is slight rising to 5.6 and as with the previous fields this field should have about 2.0 tons per acre of gypsum applied. This will increase the soluble Calcium and also increase the SO_4S level. The nitrate levels have fluctuated in the moderate to low range and currently are at the lowest level in the six years. The Phosphorus levels have also been down the last couple of years. Most crops would respond to Phosphorus when soil levels are below 10 ppm. I would suggest 100 pounds of P_2O_5 per acre be applied. The Potassium levels have decreased from 155 in 12/2001 to 71 in 9/2006. I would suggest an application of

200 to 300 pounds per acre of K_2O. The other aspects of this soil analysis are satisfactory.

Field 8 – The EC levels of this field have been fairly stable but over the years have been slightly increasing. They are certainly still well within the acceptable range. The soluble Calcium levels are remaining level but the Sodium levels have been increasing over the years. This in turn has caused the ESP to gradually increase until the most recent sample is at 5.8. This level can cause increasing problems with water penetration and the trend should be reversed as soon as feasible. The addition of gypsum will reverse the trend at the rate of 2 to 3 tons per acre. This will also increase the SO_4S level. The nitrate levels have been low over the years as is the current case. The Phosphorus levels have declined in the last couple of years. The addition of 100 pounds of P_2O_5 per acre should correct this deficiency. Potassium levels have been low since 2002. I would suggest the addition of 200 to 300 pounds per acre of K_2O. The rest of the soil analysis is satisfactory.

Field 9 – The EC level has gone from 2.87 in 12/2001 to 1.03 in 8/2006. The dominant salt was Calcium in 2001 and since then has been Sodium. Even though the actual amount 10.8 meq/L in 2001 has decreased to 6.8 meq/L in 2006 the ESP has increased from 4.0 to 6.3. The addition of gypsum at the rate of at least 2.0 tons per acre will increase the Calcium and Sulfate and put the soil back into balance. The nitrate levels have gone from high to low and have been low the last three years. The Phosphorus levels have gone from high to medium to low and now should have additional Phosphorus at the rate of 100 pounds per acre of P_2O_5 added. The Potassium levels are also quite low, from 226 ppm in 2001 to 64 ppm in 2006. Potassium needs to be added at the rate of 200 to 300 pounds per acre of K_2O. The aspects of this soil analysis are satisfactory.

Field 10 – The EC level has dropped from 3.94 in 12/2001 to 0.80 in 8/2006. Soluble Calcium went from 19.9 meq/L in 12/2001 to 2.4 meq/L in 8/2006. Sodium also dropped from 13.4 meq/L in 12/2001 to 4.7 meq/L in 8/2006. Because of the big drop in Sodium the ESP only went from 4.1 to 4.3. Since the SO_4S level is quite low this field may still benefit from the addition of gypsum from a nutritional standpoint and not a water penetration problem. I would recommend 2.0 tons of gypsum per acre. The nitrate levels have dropped from high levels in 2001 to low levels in 8/2006. Phosphorus levels are still good in this field. Potassium levels have been low the past 5 years. I would suggest 200 pounds of K_2O per acre. All other aspects of this analysis are satisfactory.

Field 27 – We only have the current analysis of this field so I cannot know what the trends have been. The pH is low. The EC is low. The ESP is low. Nitrate is low. Phosphorus is low. Potassium is low. Zinc is low. Sulfate is low. Overall nutritional

level of this field is low. When this field is farmed there needs to be a good nutritional program initiated.

Field 28 – The EC levels have remained fairly constant except for the one sample on 9/2006. Even with three years data there are not many trends developing. The ESP levels are not a problem. The nitrate levels are normally low except for that one sample in 2006. Phosphorus levels are also low with the exception of the one sample in 2006. Potassium levels are all low. Zinc levels tend to be low with one sample really high in 2006. The overall nutritional level of this field is quite low. Both the Cation Exchange Capacity and Organic Matter levels are quite low also.

Field 29 – We have only one sample to look at with this field. The EC level is acceptable for most crops. The soluble Calcium and Sodium levels are in good balance. The ESP is acceptable. The nitrate level is moderate. The Phosphorus level is low. The Potassium level is good. The Zinc level is low for most crops. The Cation Exchange Capacity and Organic Matter levels indicate a positive potential for this field with an appropriate nutritional program.

Field 30 – We have only one sample to look at with this field. The EC level is acceptable for most crops. The soluble Calcium and Sodium levels are in good balance. The ESP is acceptable. The nitrate level is moderate. The Phosphorus level is low. The Potassium level is low. The Zinc level is very low for most crops. The Cation Exchange Capacity and Organic Matter levels indicate a positive potential for this field with an appropriate nutritional program.

Field 35 – We only have a couple of years of soils data but from those few samples it would indicate that the EC levels are satisfactory. The Calcium and Sodium levels are out of balance, but with the very low EC there is not a lot of salts in the soil profile. Gypsum would be beneficial to this field. Not only would gypsum balance out the Calcium Sodium relationship but also add sulfate. Nitrate is low. Phosphorus is high. Potassium is low. All of the other aspects of the soil are satisfactory.

Field 46 – There is quite a bit of variability between the samples so there are no good trends developing from the data. The data would indicate that the sampling areas have been different or there is a lot of variability in the field. The pH levels go from acidic to basic. EC goes from low to moderate. Calcium levels are fairly high and in most samples in good balance with Sodium. There are a couple of samples that are out of balance in favor of Sodium. ESP levels are all below 5. Nitrate levels are all quite high. Phosphorus levels are high. Potassium is high in 2001 and lower in 2005 and 2006. The data is so variable that it is difficult to draw any conclusions from them.

Field 160 – This field is split up into four subsections; a, b, c, and d. All of the samples are very similar in their analysis so I will address them as one unit. The EC levels are good. The soluble Calcium level is low. The Sodium levels indicate they are the dominant salt. This results in high ESP levels, all are 5.0 and over. Nitrate levels are low. Phosphorus levels are moderate. Potassium levels are all low. Zinc levels are all low. Sulfate levels are mostly low. If and when this field is farmed Phosphorus as P_2O_5 should be added at the rate of 50 to 75 pounds per acre depending upon the crop and area planted. Potassium should be added at the rate of 200 to 300 pounds of K_2O per acre. Zinc should be added at the rate of 5 to 10 pounds per acre as $ZnSO_4$. Added gypsum at the 2 tons per acre rate would be beneficial to bring up the soluble Calcium and Sulfate levels.

Fields 31, 32, 33, and 34 – All the information I have is from a one time sample from January 2007, so I can not tell of any trends that have happened over time. All of the samples are very similar in their analysis so I will address them as one unit. The EC levels are quite low. The soluble Calcium level is low. The dominant soluble salt is Sodium. The ESP levels are not high and still well below 5. Nitrate levels are low. Phosphorus levels are quite low. Potassium levels are low. Zinc levels are low. Sulfate levels are low. When these fields are farmed they will need to have gypsum added at the rate of 2 tons per acre to increase the soluble Calcium and sulfate levels. Phosphorus should be added at the rate of 100 pounds of P_2O_5 per acre. Potassium should be added at the rate of 300 pounds of K_2O per acre. Zinc should be added at the rate of 10 pounds per acre of Zinc as $ZnSO_4$.

In all fields the amount of nitrogen use is dependent upon the crop being grown. Nitrogen applied can be a combination of effluent water, biosolids, and commercial fertilizer. Each field has a residual amount of nitrate nitrogen as reported on the soil analysis, but that residual can be moved out of the root zone with a pre-irrigation before the crop is planted so it is important to apply the nitrogen for the crop.

If you have any questions, please give me a call.

Sincerely,

David R Woodruff

David R. Woodruff

Enc

Cc. John Baker, Bob Nuckols

RBSmith Consulting

MEMORANDUM

To:	Eric Casares	**Date:**	July 20, 2009
From:	Richard Smith		
Subject:	Porterville – 5-Year Cropping Pattern		

Eric, the following summarizes my thoughts on the City of Porterville 5-year cropping pattern. The previous grower followed the cropping pattern without exception and the new grower intends to follow the proposed plan from 2010 to 2014 as show by the preliminary cropping pattern that you developed. The only issue that arose during our meeting was the future use of Field #46. The grower indicated that Field #46 was difficult to irrigate because of the soil conditions and that he would prefer a continuous oat hay/fallow approach, eliminating alfalfa and Sudan grass from that field. I've looked at the prevailing soil conditions and it's my opinion that the grower's recommendation should be adopted. Field #46 is comprised of Tujunga loamy sand. That soil generally consists of 14 inches of loamy sand underlain by stratified coarse sand to loamy sand. Tujunga loamy sand tends to be droughty because of the very low moisture holding capacity. This characteristic results in the requirement for more frequent irrigations, especially during the summertime under peak ET conditions. The water infiltration and percolation rates also are very high, which makes this soil more difficult to irrigate efficiently. Cropping during late-fall, winter and early-spring with summertime fallow would be a better use of this field.

The cropping pattern for the dry farmed area is continuous oat hay/fallow, which is appropriate. The grower may want to plant other cereal grains like barley and wheat for grain, and I would consider that an acceptable option. Generally, fertilizer application rates range from about 60 to 80 pounds of nitrogen/acre for dry farmed oat hay, barley and wheat.

If you have questions/comments, please email/call.

Regards,

Richard

8814 North Fifth Street, Fresno, CA 93720: Phone 559-439-0351: Fax 559-439-7145

RBSmith Consulting

September 23, 2009

Carollo Engineers
Attn: Eric Casares
7580 N. Ingram Avenue, Suite 112
Fresno, CA 93711

Subject: City of Porterville - Agronomist Report for the Application of Biosolids on Dry Farmed Land in the Vicinity of the Porterville Airport

Dear Mr. Casares:

The purpose of the letter is to summarize the results of laboratory analyses performed on soil samples collected from the dry farmed fields in the vicinity of the Porterville Airport that will be used for future biosolids application. The samples were collected during August 2009 and submitted to Valley Tech Agricultural Laboratory for analysis. The results of the analysis provided by the laboratory are attached. Composite soil samples were collected from the surface 12-inches by walking across each field and collecting soil cores, these soil cores were then mixed and placed inside a zip-lock plastic bag with the sample identification information written on the outside of the bag. The dry farmed fields and their approximate acreage are summarized below.

Field Number	Acreage
16	40
17	40
18	20
19N	20
19S	20
20	53
21	32
22	30
23	20
25	15
Total	**290**

RBSmith Consulting, 8814 North Fifth Street, Fresno, CA 93720; (559) 439-0351

The soil samples and laboratory data are the first collected from the dry farmed fields and will provide the basis for evaluating the long-term affect, if any, from applying biosolids. The anticipated cropping pattern for these fields is oat hay, but they also would be suited for the production of cereal grains like barley and wheat. For planning purposes, dry farmed oat hay and cereal grains would normally require nitrogen fertilizer application of about 60 to 80 pounds of actual nitrogen per acre.

The results of the soil analyses have been reviewed and are discussed herein. The discussion first provides a general characterization of predominate conditions and then describes the characteristics of each field.

General Observations

The data indicate that soil salinity, measured by electrical conductivity (EC) is within acceptable ranges to facilitate the production of agricultural crops, including those sensitive to soluble salts. The low salinity levels appear to be the result of leaching soluble calcium and sulfate, probably as gypsum from the surface soil. Even though gypsum has been leached from the surface soil zone, calcium remains the dominant cation. The potential sodium hazard, as measured by the exchangeable sodium percentage (ESP) is low indicating that potential problems related to poor water infiltration would not be expected.

The soil reaction, as measured by pH, is slightly more acidic than desirable. Acidic soils are usually formed as a result of three processes: 1) removal of cations (sodium, calcium, magnesium and potassium) by leaching; 2) removal of cations by crop uptake; and 3) repeated applications of acid-forming fertilizer. Coarser textured soils, like those at the site, are more susceptible to acidification because of their lower cation exchange capacity. These soils would probably benefit from the periodic application of lime or gypsum, which could be beneficial by both increasing pH and calcium. Future soil sampling and analysis should include determination of the lime and gypsum requirements in order to quantify the amount of these amendments necessary to manage pH and calcium.

The cation exchange capacity (CEC) is a measure of the soils capacity to hold and exchange nutrients (cations) and is an indication of the inherit fertility of the soil. Soils with low CEC are less fertile than soils with high CEC and coarse textured soils have lower CEC's. Based on the soil saturation percentage (SP), soil texture is sandy loam and the expected CEC would range from about 7 to 15. It's difficult to increase the CEC appreciably because of its close relationship with soil texture; however, applications of organic matter, such as biosolids, are often beneficial.

The soil nutritional aspects of these fields can be characterized as low in potassium, with a lower that desirable pH. Acidic pH can under some conditions affect the availability of certain soil minerals for plant uptake. Phosphorous and nitrogen concentrations are adequate to high. There are not any dangerously high levels of any of the other constituents reported.

Individual Fields

Field #16 – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is too low, which may affect the availability of some mineral nutrients. Calcium also is low, and applications of lime or perhaps gypsum would likely be beneficial. Future soil analyses should measure the lime and gypsum requirements. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate and phosphorous levels are adequate to high, and potassium levels are low. The remaining aspects of the analysis are acceptable.

Field #17 – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The calcium is low and this field would probably benefit from the application of gypsum. . The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate, phosphorous and potassium levels are adequate. The remaining aspects of the analysis are acceptable.

Field #18 - The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is too low, which may affect the availability of some mineral nutrients. Calcium also is low, and applications of lime or perhaps gypsum would likely be beneficial. Future soil analyses should measure the lime and gypsum requirements. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate and phosphorous levels are adequate to high, and potassium levels are likely adequate. The remaining aspects of the analysis are acceptable.

Field #19 North – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is too low, which may affect the availability of some mineral nutrients. Calcium also is low, and applications of lime or perhaps gypsum would likely be beneficial. Future soil analyses should measure the lime and gypsum requirements. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate and phosphorous levels are adequate to high, and potassium levels are likely adequate. The remaining aspects of the analysis are acceptable.

Field #19 South – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is too low, which may affect the availability of some mineral nutrients. Calcium also is low, and applications of lime or perhaps gypsum would likely be beneficial. Future soil analyses should measure the lime and gypsum requirements. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level

of 5 where sodium related problems could be expected to occur. Nitrate and phosphorous levels are adequate, and potassium levels are low. The remaining aspects of the analysis are acceptable.

Field #20 – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is too low, which may affect the availability of some mineral nutrients. Calcium also is low, and applications of lime or perhaps gypsum would likely be beneficial. Future soil analyses should measure the lime and gypsum requirements. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate and phosphorous levels are adequate to high, and potassium levels are low. The remaining aspects of the analysis are acceptable.

Field #21 – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is just below the acceptable range. Calcium also is low, and applications of lime or perhaps gypsum would likely be beneficial. Future soil analyses should measure the lime and gypsum requirements. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate, phosphorous and potassium levels are adequate to high. The remaining aspects of the analysis are acceptable.

Field #22 – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is within the acceptable range. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate and phosphorous levels are adequate to high, and potassium and zinc levels are low. The remaining aspects of the analysis are acceptable.

Field #23 – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is within the acceptable range. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate, phosphorous and potassium levels are adequate to high. The remaining aspects of the analysis are acceptable.

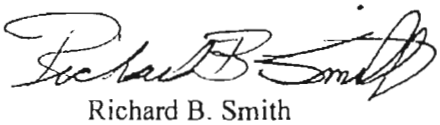
Field #25 – The EC level is low and this field is suited to the proposed dry farmed crops from a salinity perspective. The pH is just below the acceptable range. Calcium also is low, and applications of lime or perhaps gypsum would likely be beneficial. Future soil analyses should measure the lime and gypsum requirements. Calcium is the dominant cation and the sodium hazard is low. The exchangeable sodium percentage is less than 1.0, which is well below the threshold level of 5 where sodium related problems could be expected to occur. Nitrate and phosphorous levels are adequate to high, and potassium levels are low. The remaining aspects of the analysis are acceptable.

Comments

The amount of nitrogen uptake is dependent on the crop grown and the growing environment. Assuming the proposed dry farm crop production regime, applied nitrogen would be from biosolids or chemical fertilizer applications. Each field contains residual nitrogen, but actual nitrogen conditions can vary largely based annual rainfall and resultant affects from leaching. Biosolids applications should be beneficial for these soils and future monitoring will determine whether supplemental soil amendment and/or chemical fertilizer applications would be necessary.

If you have questions or comments, please call.

Sincerely,



Richard B. Smith

RBSmith Consulting, 8814 North Fifth Street, Fresno, CA 93720; (559) 439-0351

SOIL ANALYSIS

Client: CITY of PORTERVILLE
291 No. MAIN STREET
PORTERVILLE, CALIFORNIA 93257

Material: SOIL

RANCH: BOB C. NUCKOLS

Lab No.: 08-19S403
Submitted Date: 08-19-09
Report Date: 08-28-09
Submitted By: ROBERT ALVAREZ

DESCRIPTION	% SP	pH	EC dS/m	meq/L Ca	meq/L Mg	meq/L Na	meq/L K	meq/L Cl	% ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	PPM NO_3N	PPM PO_4P	PPM K AA	PPM Zn	PPM Mn	PPM Fe	PPM Cu	PPM SO_4S
1. Fld #16	24	5.2	0.82	4.1	2.5	1.4	0.2	1.1	<1.0	0.03	-	0.3	22.0	50.3	90	5.4	64.8	44.4	2.9	24
2. Fld #17	32	6.4	1.09	6.6	2.7	1.1	0.5	1.1	<1.0	0.08	-	0.7	15.0	47.1	230	8.0	38.2	37.9	2.0	24
3. Fld #18	26	5.2	1.94	11.4	6.4	1.3	0.3	0.8	<1.0	0.09	-	0.4	48.8	35.1	149	3.9	57.5	50.5	2.7	29
4. Fld #19 No.	25	5.0	1.59	8.3	5.8	1.5	0.3	0.7	<1.0	0.06	-	0.3	37.6	36.7	149	3.1	100.3	56.8	2.8	41
5. Fld #19 So.	25	5.5	2.33	13.8	7.2	1.8	0.4	0.9	<1.0	0.06	-	0.2	20.3	33.5	118	2.4	78.0	42.5	2.0	201
6. Fld #20	29	5.0	1.82	11.0	5.4	1.5	0.3	0.5	<1.0	0.05	-	0.4	17.7	77.1	105	6.2	52.5	70.2	3.2	149
7. Fld #21	31	5.9	1.79	10.9	4.2	1.7	1.0	1.2	<1.0	0.09	-	0.7	55.8	42.1	221	7.5	58.2	40.7	2.9	24
8. Fld #22	28	6.4	1.40	9.8	3.3	0.8	0.2	0.6	<1.0	0.09	-	0.2	15.6	62.6	99	1.6	39.9	42.7	1.7	52
9. Fld #23	28	6.5	1.01	6.7	2.4	0.7	0.3	0.7	<1.0	0.08	-	0.2	33.1	43.5	192	3.5	31.3	20.4	2.3	21
10. Fld #25	26	5.8	0.70	3.8	1.9	1.2	0.2	0.5	<1.0	0.06	-	0.2	25.5	17.9	73	2.1	56.1	29.3	1.3	17
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5		>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50

DESCRIPTION	Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
	EXCHANGEABLE CATIONS (ppm - %)																	
1. Fld #16	826	-	63.7	194	-	24.9	17	-	1.6	90	-	3.5	4	-	6.2	6.5	1.53	656
2. Fld #17	2042	-	74.3	301	-	18.2	23	-	1.0	230	-	4.3	3	-	2.2	13.7	3.00	1,713
3. Fld #18	1829	-	68.9	383	-	24.1	23	-	1.1	149	-	2.9	4	-	3.0	13.3	1.63	814
4. Fld #19 No.	1473	-	63.3	400	-	28.6	25	-	1.3	149	-	3.3	4	-	3.4	11.6	1.50	752
5. Fld #19 So.	1066	-	66.5	225	-	23.4	17	-	1.4	118	-	3.8	4	-	5.0	8.0	1.48	733
6. Fld #20	1165	-	69.7	201	-	20.0	31	-	2.3	105	-	3.2	4	-	4.8	8.4	2.23	1,233
7. Fld #21	1442	-	71.1	217	-	17.9	24	-	1.5	221	-	5.6	4	-	3.9	10.1	2.40	1,465
8. Fld #22	2049	-	80.1	227	-	14.8	17	-	0.8	99	-	2.0	3	-	2.3	12.8	1.75	709
9. Fld #23	2079	-	76.3	291	-	17.8	16	-	0.8	192	-	3.6	2	-	1.5	13.6	1.86	927
10. Fld #25	974	-	68.1	191	-	22.3	17	-	1.5	73	-	2.6	4	-	5.6	7.2	1.30	576
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%					1.0%	1,000

RED = LOW BLUE = HIGH DOMINANT SOLUBLE SALT IS UNDERLINED. SEE ENCLOSED INTERPRETATION GUIDES.

IF YOU SHOULD HAVE ANY QUESTIONS, PLEASE CALL. THANK YOU.

Joe O'Brien - Soil Technologist

Appendix A	Crop Irrigation Demands 2010 Biosolids Management Five-Year Plan City of Porterville				
Crop	Alfalfa (ac-in)	Sudan (ac-in)	Oat Hay (ac-in)	Oat Hay/Sudan (ac-in)	Cotton (ac-in)
January	1.77	0	1.77	1.77	0
Februrary	2.8	0	2.8	2.8	0
March	4.48	0	4.87	4.87	0
April	6.63	0	7.29	7.29	0
May	8.87	0	4.87	4.87	3.41
June	10.47	5.57	0	5.57	7.35
July	11.17	13.24	0	13.24	10.71
August	10.49	11.71	0	11.71	9.47
September	8.02	8.87	0	8.87	7.02
October	5.47	3.45	0	3.45	3.24
November	2.57	0	1.29	1.29	0
December	1.33	0	1.33	1.33	0
Total	**74.07**	**42.84**	**24.22**	**67.06**	**41.21**

Note:
(1) Irrigation demand for alflalfa, sudan and oat hay was provided by the agronomist, D.A. Woodruf. Irrigation demand for other combination (oat hay/sudan) is calculated by addition of the individual irrigation demands.

APPENDIX B - BIOSOLIDS DATA

Appendix B	Effluent Flow and Biosolids Production (1.0% Growth Rate per Year) 2010 Biosolids Management Five-Year Plan City of Porterville			
Year	Growth Rate (1.0 Percent)	Flow AAWF (mgd)	Projected Biosolids Production (tons/year)	Total Biosolids Applied[2] (tons/year)
2011[1]	1.01	4.71	1,050	1,524
2012	1.01	4.76	1,070	1,498
2013	1.01	4.81	1,090	1,455
2014	1.01	4.86	1,110	1,404
2015	1.01	4.91	1,130	1,553
Total			**5,450**	**7,434**

Notes:
(1) Based on historical flow data and assumed 1.0 percent growth rate.
(2) Values based on agronomic loading rate calculations with effluent irrigation.

Appendix B	Biosolids Sampling Results - 2009 2010 Biosolids Management Five-Year Plan City of Portervllle				
			General Order	40 CFR 503	
Constituent	Units	Biosolids Sampling Results - 2009	Ceiling Concentrations	Ceiling Concentrations	Exceptional Quality
Arsenic	mg/kg	2.7	75	75	41
Cadmium	mg/kg	3.9	85	85	39
Copper	mg/kg	411	4,300	4,300	1,500
Lead	mg/kg	42.5	840	840	300
Mercury	mg/kg	1.41	57	57	17
Molybdenum	mg/kg	12.7	75	75	-
Nickel	mg/kg	18.9	420	420	420
Selenium	mg/kg	2.1	100	100	100
Zinc	mg/kg	1,062	7,500	7,500	2,800
Total Potassium	mg/kg	5,186	-	-	-
pH	-	7.5	-	-	-
Total Solids Content	percent	78.1	-	-	-
Total Nitrogen	mg/kg	39,530	-	-	-
Total Kjeldahl Nitrogen	mg/kg	38,998	-	-	-
Ammonia Nitrogen (as N)	mg/kg	2,835	-	-	-
Nitrate (as N)	mg/kg	511	-	-	-
Total Coliform	MPN/gm	76.4	-	-	-

Appenidx B	EXAMPLE: Background Cumulative Adjusted Loading Rate (BC) using General Order Formula for Dry Farmed Areas 2010 Biosolids Management Five-Year Plan City of Porterville								
Constituent	RP	BS[1]	BC[2]		Biosolids Sampling Results - 2009			Years to reach BC[5]	Years to reach BC[6]
	(lbs/acre)	(mg/kg)	(lbs/acre)	(mg/kg)	(mg/kg)	(lbs/ ton)[3]	(lbs/acre)[4]	(years)	(years)
Arsenic	37	2.5	32.5	18.1	2.7	0.005	0.1	231	694
Cadmium	35	0.3	34.5	19.1	3.9	0.008	0.2	170	510
Copper	1339	16.5	1309.3	727.4	411	0.822	21.4	61	184
Lead	268	8.8	252.2	140.1	42.5	0.085	2.2	114	342
Mercury	16	0.04	15.9	8.8	1.41	0.003	0.1	218	654
Molybdenum	67	0.7	65.7	36.5	12.7	0.025	0.7	100	299
Nickel	375	14.3	349.3	194.0	18.9	0.038	1.0	355	1066
Selenium	90	0.5	89.1	49.5	2.1	0.004	0.1	816	2448
Zinc	2499	48	2412.6	1340.3	1,062	2.123	55.2	44	131

Notes:

(1) Average concentrations of all fields, used for this example.

(2) Calculated using formula BC (lbs ac) = RP (lbs/ac) - 1.8 x BS (mg/Kg)

(3) (Lbs/Ton) = (mg/Kg) x (1 / 500)

(4) Assuming biosolids are applied at 26 tons/acre

(5) Years = BC / Biosolids in Lbs/Acre, if applied at same loading rate annually

(6) Years = BC / Biosolids in Lbs/Acre, if applied at same loading rate every three years

BC = Background Cumulative Adjusted Loading Rate (lbs/acre)

RP = 40 CFR Part 503 Cumulative Pollutant Loading Rate (lbs/acre)

BS = Actual Site Background Site Soil Concentration (mg/Kg)

For illustrative purposes. Actual loading rates will be determined for each individual field, using site specific data.

Appenidx B	EXAMPLE: Background Cumulative Adjusted Loading Rate (BC) using General Order Formula 2010 Biosolids Management Five-Year Plan City of Porterville								
Constituent	RP	BS[1]	BC[2]		Biosolids Sampling Results - 2009			Years to reach BC[5]	Years to reach BC[6]
	(lbs/acre)	(mg/kg)	(lbs/acre)	(mg/kg)	(mg/kg)	(lbs/ ton)[3]	(lbs/acre)[4]	(years)	(years)
Arsenic	37	2.1	33.3	18.5	2.7	0.005	0.1	237	712
Cadmium	35	2.6	30.4	16.9	3.9	0.008	0.2	150	449
Copper	1339	18.5	1305.6	725.3	411	0.822	21.4	61	183
Lead	268	8.8	252.1	140.1	42.5	0.085	2.2	114	342
Mercury	16	0.1	15.8	8.8	1.41	0.003	0.1	217	650
Molybdenum	16	5.3	6.4	3.6	12.7	0.025	0.7	10	29
Nickel	375	16.6	345.1	191.7	18.9	0.038	1.0	351	1053
Selenium	90	0.0	90.0	50.0	2.1	0.004	0.1	824	2472
Zinc	2499	50.2	2408.6	1338.1	1,062	2.123	55.2	44	131

Notes:

(1) Average concentrations of all fields, used for this example.

(2) Calculated using formula BC (lbs ac) = RP (lbs/ac) - 1.8 x BS (mg/Kg)

(3) (Lbs/Ton) = (mg/Kg) x (1 / 500)

(4) Assuming biosolids are applied at 26 tons/acre

(5) Years = BC / Biosolids in Lbs/Acre, if applied at same loading rate annually

(6) Years = BC / Biosolids in Lbs/Acre, if applied at same loading rate every three years

BC = Background Cumulative Adjusted Loading Rate (lbs/acre)

RP = 40 CFR Part 503 Cumulative Pollutant Loading Rate (lbs/acre)

BS = Actual Site Background Site Soil Concentration (mg/Kg)

For illustrative purposes. Actual loading rates will be determined for each individual field, using site specific data.

BIOSOLIDS AGRONOMIC LOADING RATES - FIVE-YEAR PLAN
(WITHOUT EFFLUENT IRRIGATION DURING FIRST YEAR OF BIOSOLIDS APPLICATION)

Constituent	mg/kg	%
Total Nitrogen	39,530	3.95
Nitrate Nitrogen	511	0.05
Ammonia Nitrogen	2,835	0.28
Organic Nitrogen (calc.)	36,184	3.62
Plant Available Nitrogen (PAN)		18.33

Formula used
Organic N = Total Nitrogen - Ammonia as N - Nitrate as N
PAN = {(Nitrate as N) + 0.5 x (Ammonia as N) + 0.2 x (Organic N)} x 20

Nitrogen rqmt. of Alfalfa	lbs/acre	480	
PAN	lbs/ton	18.33	
Allowable Sludge Loading	ton/acre	26.2	26.2 tons/acre
Sludge produced annually	tons	1,130	
Acreage need to spread the sludge	acres	43	

Nitrogen rqmt. of Oat Hay (OH)	lbs/acre	60	
PAN	lbs/ton	18.33	
Allowable Sludge Loading	ton/acre	3.3	3.3 tons/acre
Sludge produced annually	tons	1,130	
Acreage need to spread the sludge	acres	345	

Nitrogen rqmt. of OH (Dry Farmed)	lbs/acre	115	
PAN	lbs/ton	18.33	
Allowable Sludge Loading	ton/acre	6.3	6.3 tons/acre
Sludge produced annually	tons	1,130	
Acreage need to spread the sludge	acres	180	

Nitrogen rqmt. of Cotton	lbs/acre	175	
PAN	lbs/ton	18.33	
Allowable Sludge Loading	ton/acre	9.5	9.5 tons/acre
Sludge produced annually	tons	1,130	
Acreage need to spread the sludge	acres	118	

Nitrogen rqmt. of Sudan/Oat Hay	lbs/acre	440	(Double cropped field)
PAN	lbs/ton	18.33	
Allowable Sludge Loading	ton/acre	24.0	24.0 tons/acre
Sludge produced annually	tons	1,130	
Acreage need to spread the sludge	acres	47	

Crop Year - 2011 (October 2010 spreading)	Field	Acres	Crop for Crop Year 2010	Estimated Biosolids Loading Rate tons/acre	Allowable Total Tons Applied
	5S	20	Alfalfa	26.2	524
	8	18	Oat Hay/Sudan	24.0	432
	30	43	Alfalfa	26.2	1126
	31	23	Alfalfa	26.2	602
	33	8	Alfalfa	26.2	209
	34	21	Alfalfa	26.2	550
	35	31	Alfalfa	26.2	812
Total		**164**			**4,255**

Notes:

(1) Loading rates for this year are estimated, using PAN values above. Actual loading rates will be determined with the actual constituent concentrations for the biosolids that will be applied during the 2011 crop year.
(2) Spread biosolids in Oct 2010.
(3) Seed sudan in Jun 2011.
(4) Seed alfalfa in Nov 2010.
(5) Seed oat hay in Nov 2010.

Crop Year - 2012 (October 2011 spreading)	Field	Acres	Crop for Crop Year 2011	Estimated Biosolids Loading Rate tons/acre	Allowable Total Tons Applied
	5N	20	Alfalfa	26.2	524
	46A	30	Alfalfa	26.2	786
	160A	40	Oat Hay/Sudan	24.0	960
	160B	40	Oat Hay/Sudan	24.0	960
	160C	40	Alfalfa	26.2	1047
Total		**170**			**4,277**

Notes:

(1) Loading rates for this year are estimated, using PAN values above. Actual loading rates will be determined with the actual constituent concentrations for the biosolids that will be applied during the 2012 crop year.
(2) Spread biosolids in Oct 2011.
(3) Seed sudan in Jun 2012.
(4) Seed alfalfa in Nov 2011.
(5) Seed oat hay in Nov 2011.

Crop Year - 2013 (October 2012 spreading)	Field	Acres	Crop for Crop Year 2012	Estimated Biosolids Loading Rate tons/acre	Allowable Total Tons Applied
	7	34	Oat Hay/Sudan	24.0	816
	9	14	Oat Hay/Sudan	24.0	336
	10	32	Oat Hay/Sudan	24.0	768
	18	20	Oat Hay/Fallow	3.3	65
	19N	20	Oat Hay/Fallow	3.3	65
	19S	20	Oat Hay/Fallow	3.3	65
	20	53	Oat Hay/Fallow	3.3	173
	21	32	Oat Hay/Fallow	3.3	105
	22	30	Oat Hay/Fallow	3.3	98
	28B	19	Alfalfa	26.2	498
Total		**274**			**2,991**

Notes:

(1) Loading rates for this year are estimated, using PAN values above. Actual loading rates will be determined with the actual constituent concentrations for the biosolids that will be applied during the 2013 crop year.
(2) Spread biosolids in Oct 2012.
(3) Seed sudan in Jun 2013.
(4) Seed alfalfa in Nov 2012.
(5) Seed oat hay in Nov 2012.

Crop Year - 2014 (October 2013 spreading)	Field	Acres	Crop for Crop Year 2013	Estimated Biosolids Loading Rate tons/acre	Allowable Total Tons Applied
	7	34	Alfalfa	26.2	890
	8	18	Alfalfa	26.2	471
	9	14	Alfalfa	26.2	367
	10	32	Alfalfa	26.2	838
	23	20	Oat Hay/Fallow	3.3	65
	25	15	Oat Hay/Fallow	3.3	49
	160B	40	Oat Hay/Sudan	24.0	960
	160D	40	Oat Hay/Sudan	24.0	960
Total		**213**			**4,601**

Notes:

(1) Loading rates for this year are estimated, using PAN values above. Actual loading rates will be determined with the actual constituent concentrations for the biosolids that will be applied during the 2014 crop year.
(2) Spread biosolids in Oct 2013.
(3) Seed sudan in Jun 2014.
(4) Seed alfalfa in Nov 2013.
(5) Seed oat hay in Nov 2013.

Crop Year - 2015 (October 2014 spreading)	Field	Acres	Crop for Crop Year 2014	Estimated Biosolids Loading Rate tons/acre	Allowable Total Tons Applied
	17	40	Oat Hay/Fallow	3.3	131
	20	53	Oat Hay/Fallow	3.3	173
	21	32	Oat Hay/Fallow	3.3	105
	27	31	Alfalfa	26.2	812
	29	38	Alfalfa	26.2	995
	32	57	Alfalfa	26.2	1493
Total		**251**			**3,709**

Notes:

(1) Loading rates for this year are estimated, using PAN values above. Actual loading rates will be determined with the actual constituent concentrations for the biosolids that will be applied during the 2015 crop year.
(2) Spread biosolids in Oct 2014.
(3) Seed sudan in Jun 2015.
(4) Seed alfalfa in Nov 2014.
(5) Seed oat hay in Nov 2014.

Total amount of biosolids that can be applied in 5 years (without effluent irrigation)	19,833

Appendix B	Biosolids Application - 2011 2010 Biosolids Management Five Year Plan City of Porterville				
Field	Area (acres)	Crop	Allowable Biosolids Nitrogen Loading (lbs/acre)	Allowable Biosolids Application (dry tons/acre)	Total Applied (dry tons)
5S	20	Alfalfa	166.4	9.1	182
8	18	Oat Hay/Sudan	156.1	8.5	153
30	43	Alfalfa	153.6	8.4	360
31	23	Alfalfa	153.6	8.4	193
33	8	Alfalfa	153.6	8.4	67
34	21	Alfalfa	166.4	9.1	191
35	31	Alfalfa	166.4	9.1	281
Total	164				1,427

Appendix B	Biosolids Application - 2012 2010 Biosolids Management Five Year Plan City of Porterville				
Field	Area (acres)	Crop	Allowable Biosolids Nitrogen Loading (lbs/acre)	Allowable Biosolids Application (dry tons/acre)	Total Applied (dry tons)
5N	20	Alfalfa	166.4	9.1	182
46A	30	Alfalfa	166.4	9.1	272
160A	40	Oat Hay/Sudan	156.1	8.5	341
160B	40	Oat Hay/Sudan	156.1	8.5	341
160C	40	Alfalfa	166.4	9.1	363
Total	170				1,498

Appendix B	Biosolids Application - 2013 2010 Biosolids Management Five Year Plan City of Porterville				
Field	Area (acres)	Crop	Allowable Biosolids Nitrogen Loading (lbs/acre)	Allowable Biosolids Application (dry tons/acre)	Total Applied (dry tons)
7	34	Oat Hay/Sudan	156.1	8.5	289
9	14	Oat Hay/Sudan	156.1	8.5	119
10	32	Oat Hay/Sudan	156.1	8.5	272
18	20	Oat Hay/Fallow	60.0	3.3	65
19N	20	Oat Hay/Fallow	60.0	3.3	65
19S	20	Oat Hay/Fallow	60.0	3.3	65
20	53	Oat Hay/Fallow	60.0	3.3	173
21	32	Oat Hay/Fallow	60.0	3.3	105
22	30	Oat Hay/Fallow	60.0	3.3	98
28B	19	Alfalfa	166.4	9.1	172
Total	274				1,426

Appendix B	Biosolids Application - 2014 2010 Biosolids Management Five Year Plan City of Porterville				
Field	Area (acres)	Crop	Allowable Biosolids Nitrogen Loading (lbs/acre)	Allowable Biosolids Application (dry tons/acre)	Total Applied (dry tons)
7	34	Alfalfa	117.1	6.4	217
8	18	Alfalfa	166.4	9.1	163
9	14	Alfalfa	117.1	6.4	89
10	32	Alfalfa	117.1	6.4	204
23	20	Oat Hay/Fallow	60.0	3.3	65
25	15	Oat Hay/Fallow	60.0	3.3	49
160B	40	Oat Hay/Sudan	133.9	7.3	292
160D	40	Oat Hay/Sudan	156.1	8.5	341
Total	213				1,422

Appendix B	Biosolids Application - 2015 2010 Biosolids Management Five Year Plan City of Porterville				
Field	Area (acres)	Crop	Allowable Biosolids Nitrogen Loading (lbs/acre)	Allowable Biosolids Application (dry tons/acre)	Total Applied (dry tons)
17	40	Oat Hay/Fallow	60.0	3.3	131
20	53	Oat Hay/Fallow	51.5	2.8	149
21	32	Oat Hay/Fallow	51.5	2.8	90
27	31	Alfalfa	166.4	9.1	281
29	38	Alfalfa	166.4	9.1	345
32	57	Alfalfa	166.4	9.1	517
Total	251				1,513

Appendix B **Mineralized Nitrogen Account**
2010 Biosolids Management Five-Year Plan
City of Porterville

Summary from Biosolids Reports

Source	Biosolids Report Year	TKN (%)	NH_4 (%)	Available Org-N (lbs/ton)
Soil/Sludge	Jan-09	0.15100	0.00100	3.0
Sludge	Oct-09	3.90193	0.28350	72.4
Sludge	Oct-10	3.90193	0.28350	72.4

Breakdown by Field

Field 7

Application Date: October-12
From: Sludge
Biosolids Application (tons/acre): 8.51

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
12/13	616.09	0.20	123.22	492.88
13/14	492.88	0.10	49.29	443.59
14/15	443.59	0.05	22.18	421.41

Field 9

Application Date: October-12
From: Sludge
Biosolids Application (tons/acre): 8.51

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
12/13	616.09	0.20	123.22	492.88
13/14	492.88	0.10	49.29	443.59
14/15	443.59	0.05	22.18	421.41

Field 10

Application Date: October-12
From: Sludge
Biosolids Application (tons/acre): 8.51

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
12/13	616.09	0.20	123.22	492.88
13/14	492.88	0.10	49.29	443.59
14/15	443.59	0.05	22.18	421.41

Field 20

Application Date: October-12
From: Sludge
Biosolids Application (tons/acre): 3.27

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
12/13	236.88	0.20	47.38	189.51
13/14	189.51	0.10	18.95	170.56
14/15	170.56	0.05	8.53	162.03

Appendix B	Mineralized Nitrogen Account 2010 Biosolids Management Five-Year Plan City of Porterville

Summary from Biosolids Reports

Source	Biosolids Report Year	TKN (%)	NH_4 (%)	Available Org-N (lbs/ton)
Soil/Sludge	Jan-09	0.15100	0.00100	3.0
Sludge	Oct-09	3.90193	0.28350	72.4
Sludge	Oct-10	3.90193	0.28350	72.4

Breakdown by Field

Field 21

Application Date: October-12
From: Sludge
Biosolids Application (tons/acre): 3.27

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
12/13	236.88	0.20	47.38	189.51
13/14	189.51	0.10	18.95	170.56
14/15	170.56	0.05	8.53	162.03

Field 30

Application Date: January-09
From: Soil/Sludge Mixture
Biosolids Application (tons/acre): 53.10

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
09/10	159.30	0.20	31.86	127.44
10/11	127.44	0.10	12.74	114.70
11/12	114.70	0.05	5.73	108.96

Application Date: October-10
From: Sludge
Biosolids Application (tons/acre): 8.38

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
10/11	606.52	0.20	121.30	485.21
11/12	485.21	0.10	48.52	436.69
12/13	436.69	0.05	21.83	414.86

Appendix B **Mineralized Nitrogen Account**
2010 Biosolids Management Five-Year Plan
City of Porterville

Summary from Biosolids Reports

Source	Biosolids Report Year	TKN (%)	NH_4 (%)	Available Org-N (lbs/ton)
Soil/Sludge	Jan-09	0.15100	0.00100	3.0
Sludge	Oct-09	3.90193	0.28350	72.4
Sludge	Oct-10	3.90193	0.28350	72.4

Breakdown by Field

Field 31

Application Date: January-09
From: Soil/Sludge Mixture
Biosolids Application (tons/acre): 53.10

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
09/10	159.30	0.20	31.86	127.44
10/11	127.44	0.10	12.74	114.70
11/12	114.70	0.05	5.73	108.96

Application Date: October-10
From: Sludge
Biosolids Application (tons/acre): 8.38

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
10/11	606.52	0.20	121.30	485.21
11/12	485.21	0.10	48.52	436.69
12/13	436.69	0.05	21.83	414.86

Field 33

Application Date: January-09
From: Soil/Sludge Mixture
Biosolids Application (tons/acre): 53.10

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
09/10	159.30	0.20	31.86	127.44
10/11	127.44	0.10	12.74	114.70
11/12	114.70	0.05	5.73	108.96

Application Date: October-10
From: Sludge
Biosolids Application (tons/acre): 9.08

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
10/11	656.83	0.20	131.37	525.46
11/12	525.46	0.10	52.55	472.92
12/13	472.92	0.05	23.65	449.27

Appendix B **Mineralized Nitrogen Account**
2010 Biosolids Management Five-Year Plan
City of Porterville

Summary from Biosolids Reports

Source	Biosolids Report Year	TKN (%)	NH_4 (%)	Available Org-N (lbs/ton)
Soil/Sludge	Jan-09	0.15100	0.00100	3.0
Sludge	Oct-09	3.90193	0.28350	72.4
Sludge	Oct-10	3.90193	0.28350	72.4

Breakdown by Field

Field 34

Application Date: October-10
From: Sludge
Biosolids Application (tons/acre): 9.08

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
10/11	656.83	0.20	131.37	525.46
11/12	525.46	0.10	52.55	472.92
12/13	472.92	0.05	23.65	449.27

Field 35

Application Date: October-10
From: Sludge
Biosolids Application (tons/acre): 9.08

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
10/11	656.83	0.20	131.37	525.46
11/12	525.46	0.10	52.55	472.92
12/13	472.92	0.05	23.65	449.27

Field 160B

Application Date: October-11
From: Sludge
Biosolids Application (tons/acre): 8.51

Year	Starting Org N	Mineralization Rate	Mineralized Org-N	Org-N Remaining
11/12	616.09	0.20	123.22	492.88
12/13	492.88	0.10	49.29	443.59
13/14	443.59	0.05	22.18	421.41

Appendix B	Estimation of Evaporation Rate from Surface of Ponds 2010 Biosolids Management Five-Year Plan City of Porterville				
	100-Year Precipitation in/month (A)	Lake Evaporation inches (B)	Net Gain/Loss inches (C)	Average Rainfall inches (D)	Pan Evap inches (E)
January	4.23	1.14	2.93	1.9	1.30
February	4.01	2.02	1.71	1.8	2.30
March	4.01	3.70	-0.19	1.8	4.20
April	2.23	5.19	-3.67	1	5.90
May	1.11	7.30	-7.19	0.5	8.30
June	0.22	8.45	-9.38	0.1	9.60
July	0.00	8.80	-10.00	0	10.00
August	0.00	7.48	-8.50	0	8.50
September	0.45	5.54	-5.85	0.2	6.30
October	1.11	3.87	-3.29	0.5	4.40
November	2.23	1.85	0.13	1	2.10
December	3.57	0.88	2.57	1.6	1.00
Total	**23.18**	**56.23**	**-40.72**	**10.4**	**63.90**

(A) Based on Porterville's 100 year rain event and Porterville's monthly rainfall distribution.
(B) = (E)*0.8*1.10. Evap = pan evaporation rates*Cp*K. Ep = pan evaporation rates, based on San Joaquin Valley Class A pan evaporation rates.
Source= California Department of Water Resources. "Vegetative Water use in California", April 1975, Bulletin 113-3, Table 1, pg 9. Cp = pan coefficient to correct for excess evaporation from a pan as compared to a large body of water. K = weather correction reflecting that in wetter years, evaporation is less. K = 1.10 for dry conditions.
(D) Derived from www.worldclimate.com

CROP PLAN 2011 (Crop Year)		
Field	**Acres**	**2011**
Reclamation/Dry Farmed Areas		(Nov 2010 - Oct 2011)
5S	20	Alfalfa
27	31	Alfalfa
29	38	Alfalfa
30	43	Alfalfa
31	23	Alfalfa
32	57	Alfalfa
33	8	Alfalfa
34	21	Alfalfa
35	31	Alfalfa
160A	40	Alfalfa
160B	40	Alfalfa
160D	40	Alfalfa
Total	**392**	
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
28A	14	Oat Hay/Fallow
46B	17	Oat Hay/Fallow
Total	**281**	
7	34	Oat Hay/Sudan
8	18	Oat Hay/Sudan
9	14	Oat Hay/Sudan
10	32	Oat Hay/Sudan
160C	40	Oat Hay/Sudan
Total	**138**	
5N	20	Cotton
28B	19	Cotton
46A	30	Cotton
Total	**69**	
Grand Total	**880**	
Dry-Farmed Area		
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
Total	**250**	
Grand Total	**250**	

Appendix C	Water Balance - 2011 2010 Biosolids Management Five Year Plan City of Porterville						
			Effluent Ponds				
Month	WW Flow (mg) (A)	WW Flow (ac-ft) (B)	Precip. Gains (ac-ft) (C)	Evap. Loss (ac-ft) (D)	Irrig Schedule (ac-ft) (E)	Percolation Required (ac-ft) (F)	
January	138.5	425.1	18.17	4.91	83	355.6	
February	125.5	385.3	17.22	8.69	131	262.9	
March	142.0	435.9	17.22	15.86	215	222.3	
April	142.9	438.6	9.57	22.28	319	106.6	
May	151.0	463.3	4.78	31.35	378	58.8	
June	148.7	456.4	0.96	36.26	421	0.0	
July	154.3	473.6	0.00	37.77	436	0.0	
August	155.0	475.7	0.00	32.10	444	0.0	
September	147.2	451.9	1.91	23.79	404	25.6	
October	146.2	448.6	4.78	16.62	237	199.7	
November	136.6	419.3	9.57	7.93	102	318.8	
December	133.2	408.8	15.30	3.78	62	358.1	
Total (Rounded)	**1,721**	**5,282**	**99**	**241**	**3,232**	**1,909**	
			Overall Annual Perc. Rate (ft/yr) =			**37**	
(A) Based on a wastewater flow (B) = (A)*3.069 (C) Based on 51.5 acres of percolation area (D) Based on 51.5 acres of percolation area. (E) Planned irrigation usage. Acres Irrigated = (F) = (B) + (C) - (D) - (E)			**Assuming no losses to evap.due to rapid infilitration, perc rate increases to:**			**42**	
			630				

Appendix C Irrigation Schedule - 2011
2010 Biosolids Management Five Year Plan
City of Porterville

Month	Crop Acreage (ac)				Irrigation Demand[1] (ac-in)				Water Needed for Crop Demand[2] (ac-ft)					Wastewater Application (ac-ft)					Supplemental Water Needed for Crop Demand[3] (ac-ft)					Nitrogen Loading due to Wastewater Application[4] (lbs)				
	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total
			A				B				C					D					E					F		
January	392	31	138	69	1.77	1.77	1.77	0.00	58	5	20	0	83	58	5	20	0	83	0	0	0	0	0	2,938	232	1,034	0	4,204
February	392	31	138	69	2.80	2.80	2.80	0.00	91	7	32	0	131	91	7	32	0	131	0	0	0	0	0	4,648	368	1,635	0	6,651
March	392	31	138	69	4.48	4.87	4.87	0.00	146	13	56	0	215	146	13	56	0	215	0	0	0	0	0	7,436	639	2,846	0	10,921
April	392	31	138	69	5.63	7.29	7.29	0.00	217	19	84	0	319	217	19	84	0	319	0	0	0	0	0	11,005	957	4,260	0	16,221
May	392	31	138	69	8.87	4.87	4.87	3.41	290	13	56	20	378	290	13	56	20	378	0	0	0	0	0	14,723	639	2,846	990	19,234
June	392	31	138	69	10.47	0.00	5.61	7.35	342	0	64	42	448	321	0	60	40	421	21	0	4	3	27	16,321	0	3,057	2,018	21,396
July	392	31	138	69	11.17	0.00	13.24	10.73	365	0	152	62	579	275	0	115	48	436	90	0	38	15	143	13,961	0	5,826	2,956	22,743
August	392	31	138	69	10.49	0.00	11.73	9.47	343	0	135	54	532	286	0	112	45	444	57	0	22	9	88	14,522	0	5,707	2,309	22,538
September	392	31	138	69	8.62	0.00	8.87	7.02	282	0	102	40	424	282	0	102	40	424	0	0	0	0	0	13,315	0	5,183	2,051	20,549
October	392	31	138	69	5.47	0.00	3.45	1.24	179	0	40	15	232	179	0	40	15	237	0	0	0	0	0	9,079	0	2,016	947	12,042
November	392	31	138	69	2.57	1.29	1.29	0.00	84	5	15	0	103	84	5	15	0	103	0	0	0	0	0	4,268	163	754	0	5,185
December	392	31	138	69	1.33	1.33	1.33	0.00	43	3	15	0	62	43	3	15	0	62	0	0	0	0	0	2,208	175	777	0	3,159
Total					74.07	24.22	67.06	41.21	2,420	63	771	237	3,490	2,252	63	767	210	3,332	168	0	64	27	255	114,418	3,379	35,941	10,477	164,215
														App Rate	5.7	2.0	5.1	3.0	5.1	0.4	0.0	0.5	0.4	0.4					

Notes:
Total acreage = 630.0

(1) Irrigation demand determined by agronomist
(2) C = A x 8.72
(3) E = 42 - D
(4) F = D x 23.58 (nitrogen concentration) x 0.3258 x 8.34

Crops	Area (acres)	Nitrogen Uptake (lbs/acre)	Allowable Nitrogen Application Loading (lbs)
Alfalfa	392	480	188,160
Oat Hay	31	115	3,565
Oat Hay/Sudan	138	440	60,720
Cotton	69	175	12,075
Total	630		264,520

Crop	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton
(1) Water Needed for Crop Demand (ac-ft/year)	2,420	63	771	237
(2) Nitrogen applied (lbs/year)	122,944	3,179	39,185	12,039
(3) Acres Planted (per year (ac/year)	392	31	138	69
(4) Nitrogen Uptake Required by crops (lbs/ac)	480	115	440	175
(5) Max. Nitrogen that can be applied (lbs/year)	188,160	3,565	60,720	12,075
(6) Excess Nitrogen available for Biosolids application	65,216	386	21,535	36

5 = (3 x 4)
2 = 1 x (ww N conc)(0.3258)(8.34)

Wastewater Nitrogen Concentration (mg/L)	18.7
Supp. Water Nitrogen Concentration (mg/L)	0
Total N Applied from effluent used for Irrigation	
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)	
Total N Applied from effluent used for Irrigation	
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)	

APPENDIX D - 2012 WATER AND NITROGEN BALANCES

CROP PLAN 2012 (Crop Year)		
Field	Acres	2011
Reclamation/Dry Farmed Areas		(Nov 2011 - Oct 2012)
5N	20	Alfalfa
5S	20	Alfalfa
27	31	Alfalfa
29	38	Alfalfa
30	43	Alfalfa
31	23	Alfalfa
32	57	Alfalfa
33	8	Alfalfa
34	21	Alfalfa
35	31	Alfalfa
46A	30	Alfalfa
160C	40	Alfalfa
160D	40	Alfalfa
Total	**402**	
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
28A	14	Oat Hay/Fallow
46B	17	Oat Hay/Fallow
Total	**281**	
28B	19	Oat Hay/Sudan
160A	40	Oat Hay/Sudan
160B	40	Oat Hay/Sudan
Total	**99**	
7	34	Cotton
8	18	Cotton
9	14	Cotton
10	32	Cotton
Total	**98**	
Grand Total	**880**	
Dry-Farmed Area		
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
Total	**250**	
Grand Total	**250**	

Appendix D	Water Balance - 2012 2010 Biosolids Management Five Year Plan City of Porterville						
			Effluent Ponds				
Month	WW Flow (mg) (A)	WW Flow (ac-ft) (B)	Precip. Gains (ac-ft) (C)	Evap. Loss (ac-ft) (D)	Irrig Schedule (ac-ft) (E)	Percolation Required (ac-ft) (F)	
January	139.9	429.3	18.17	4.91	78	364.1	
February	126.8	389.1	17.22	8.69	124	273.5	
March	143.5	440.3	17.22	15.86	203	238.8	
April	144.3	443.0	9.57	22.28	301	129.2	
May	152.5	467.9	4.78	31.35	378	63.6	
June	150.2	460.9	0.96	36.26	426	0.0	
July	155.8	478.3	0.00	37.77	441	0.0	
August	156.5	480.4	0.00	32.10	448	0.0	
September	148.7	456.4	1.91	23.79	399	35.3	
October	147.6	453.0	4.78	16.62	238	203.0	
November	138.0	423.5	9.57	7.93	100	325.1	
December	134.5	412.9	15.30	3.78	59	365.4	
Total (Rounded)	1,738	5,335	99	241	3,195	1,998	
			Overall Annual Perc. Rate (ft/yr) =			39	
			Assuming no losses to evap.due to rapid infilitration, perc rate increases to:			43	
				630			

(A) Based on a wastewater flow
(B) = (A)*3.069
(C) Based on 51.5 acres of percolation area
(D) Based on 51.5 acres of percolation area.
(E) Planned irrigation usage. Acres Irrigated =
(F) = (B) + (C) - (D) - (E)

Appendix D — Irrigation Schedule - 2012
2010 Biosolids Management Five Year Plan
City of Pottersville

Month	Crop Acreage (ac)				Irrigation Demand[1] (ac-in)				Water Needed for Crop Demand[2] (ac-ft)					Wastewater Application (ac-ft)					Supplemental Water Needed for Crop Demand[3] (ac-ft)					Nitrogen Loading due to Wastewater Application[4,5] (lbs)				
	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total
			A				B				C					D					E					F		
January	402	31	99	98	1.77	1.77	1.77	0.00	59	5	15	0	78	59	5	15	0	78	0	0	0	0	0	3,012	232	742	0	3,987
February	402	31	99	98	2.80	2.80	2.80	0.00	94	7	23	0	124	94	7	23	0	124	0	0	0	0	0	4,786	368	1,174	0	6,327
March	402	31	99	98	4.48	4.87	4.87	0.00	150	13	43	0	207	150	13	43	0	207	0	0	0	0	0	7,629	639	2,041	0	10,309
April	402	31	99	98	6.63	7.29	7.29	0.00	222	19	60	0	301	222	19	60	0	301	0	0	0	0	0	11,288	957	3,056	0	15,298
May	402	31	99	98	6.87	4.87	4.87	3.41	287	13	45	28	378	287	13	45	28	378	0	0	0	0	0	15,009	639	2,041	1,411	19,194
June	402	31	99	98	10.42	0.00	5.57	7.35	351	0	46	60	457	327	0	43	56	426	24	0	3	4	31	16,606	0	2,178	2,844	21,628
July	402	31	99	98	11.17	6.62	13.24	10.71	324	0	100	97	571	249	0	84	77	411	75	0	25	20	120	14,672	0	4,283	3,429	22,384
August	402	31	99	98	10.48	0.00	11.71	9.47	351	0	97	77	525	300	0	82	66	448	52	0	14	11	77	15,237	0	4,189	3,354	22,780
September	402	31	99	98	8.02	0.00	8.52	7.52	269	0	73	57	399	269	0	73	57	399	0	0	0	0	0	12,651	0	3,718	2,913	20,283
October	402	31	99	98	5.47	0.00	3.45	3.24	183	0	28	26	238	183	0	28	26	238	0	0	0	0	0	9,311	0	1,445	1,345	12,102
November	402	31	99	98	2.67	1.28	1.28	0.00	85	3	11	0	100	85	3	11	0	100	0	0	0	0	0	4,315	169	541	0	5,025
December	402	31	99	98	1.33	1.33	1.33	0.00	45	3	11	0	59	45	3	11	0	59	0	0	0	0	0	2,264	175	558	0	2,996
Total					74.82	24.22	67.66	41.21	2,431	63	553	337	3,424	2,320	67	511	301	3,199	151	0	42	35	239	117,906	3,178	25,963	15,300	162,350
													App Rate	5.8	2.0	5.2	3.1	5.1	0.4	0.0	0.4	0.4	0.4					

Notes:
Total acreage = 930

(1) Irrigation demand determined by agronomist
(2) C = A x B/12
(3) E = C - D
(4) F = (E x 27,158 (nitrogen concentration) x 0.3258) x 8.34

Crops	Area (acres)	Nitrogen Uptake (lbs/acre)	Allowable Nitrogen Application Loading (lbs)
Alfalfa	402	480	192,960
Oat Hay	31	115	3,565
Oat Hay/Sudan	99	440	43,560
Cotton	98	175	17,150
Total	630		257,235

Crop	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton
(1) Water Needed for Crop Demand (ac-ft/year)	2,431	63	553	337
(2) Nitrogen applied (lbs/year)	126,690	3,178	28,111	17,099
(3) Acres Planted per year (ac/year)	402	31	99	98
(4) Nitrogen Uptake Required by crops (lbs/ac)	480	115	440	175
(5) Max. Nitrogen that can be applied (lbs/year)	192,960	3,565	43,560	17,150
(6) Excess Nitrogen available for Biosolids application	66,270	386	15,449	51
5 = (3 x 4)				82,760
2 = 1 x (ww N conc)(0.3258)(8.34)				

Wastewater Nitrogen Concentration (mg/L)	18.7
Supp. Water Nitrogen Concentration (mg/L)	0
Total N Applied from effluent used for irrigation	
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)	
Total N Applied from effluent used for irrigation	
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)	

APPENDIX E - 2013 WATER AND NITROGEN BALANCES

CROP PLAN 2013 (Crop Year)		
Field	**Acres**	**2011**
Reclamation/Dry Farmed Areas		(Nov 2012 - Oct 2013)
5N	20	Alfalfa
5S	20	Alfalfa
27	31	Alfalfa
28B	19	Alfalfa
29	38	Alfalfa
30	43	Alfalfa
31	23	Alfalfa
32	57	Alfalfa
33	8	Alfalfa
34	21	Alfalfa
35	31	Alfalfa
46A	30	Alfalfa
160C	40	Alfalfa
Total	**381**	
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
28A	14	Oat Hay/Fallow
46B	17	Oat Hay/Fallow
Total	**281**	
7	34	Oat Hay/Sudan
8	18	Oat Hay/Sudan
9	14	Oat Hay/Sudan
10	32	Oat Hay/Sudan
Total	**98**	
160A	40	Cotton
160B	40	Cotton
160D	40	Cotton
Total	**120**	
Grand Total	**880**	
Dry-Farmed Area		
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
Total	**250**	
Grand Total	**250**	

Appendix E	Water Balance - 2013 2010 Biosolids Management Five Year Plan City of Porterville						
			Effluent Ponds				
Month	WW Flow (mg) (A)	WW Flow (ac-ft) (B)	Precip. Gains (ac-ft) (C)	Evap. Loss (ac-ft) (D)	Irrig Schedule (ac-ft) (E)	Percolation Required (ac-ft) (F)	
January	141.3	433.6	18.17	4.91	75	371.6	
February	128.1	393.0	17.22	8.69	119	282.6	
March	144.9	444.7	17.22	15.86	195	251.4	
April	145.8	447.4	9.57	22.28	289	145.8	
May	154.0	472.6	4.78	31.35	368	78.0	
June	151.7	465.6	0.96	36.26	430	0.0	
July	157.4	483.1	0.00	37.77	445	0.0	
August	158.1	485.2	0.00	32.10	453	0.0	
September	150.2	460.9	1.91	23.79	397	41.8	
October	149.1	457.6	4.78	16.62	234	211.5	
November	139.4	427.8	9.57	7.93	95	333.9	
December	135.9	417.0	15.30	3.78	57	372.0	
Total (Rounded)	**1,756**	**5,388**	**99**	**241**	**3,158**	**2,089**	
			Overall Annual Perc. Rate (ft/yr) =			**41**	
(A) Based on a wastewater flow (B) = (A)*3.069 (C) Based on 51.5 acres of percolation area (D) Based on 51.5 acres of percolation area. (E) Planned irrigation usage. Acres Irrigated = (F) = (B) + (C) - (D) - (E)			**Assuming no losses to evap.due to rapid infilitration, perc rate increases to:**			**45**	
					630		

Appendix E Irrigation Schedule - 2013

2010 Biosolids Management Five Year Plan

City of Fayetteville

Month	Crop Acreage (ac)				Irrigation Demand[1] (ac-in)				Water Needed for Crop Demand[2] (ac-ft)					Wastewater Application (ac-ft)					Supplemental Water Needed for Crop Demand[3] (ac-ft)					Nitrogen Loading due to Wastewater Application[4] (lbs)				
	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total
			A				B				C					D					E					F		
January	381	31	88	120	1.77	1.77	1.77	0.00	56	5	14	0	75	56	5	14	0	75	0	0	0	0	0	2,855	232	734	0	3,822
February	381	31	88	120	2.80	2.80	2.80	0.00	89	7	23	0	119	89	7	23	0	119	0	0	0	0	0	4,517	368	1,162	0	6,047
March	381	31	88	120	4.45	4.87	4.87	0.00	142	13	45	0	199	142	13	45	0	199	0	0	0	0	0	7,227	639	2,021	0	9,887
April	381	31	88	120	6.63	7.29	7.29	0.00	211	15	60	0	286	211	15	60	0	286	0	0	0	0	0	10,696	857	3,025	0	14,578
May	381	31	88	120	8.87	4.87	4.87	3.47	282	13	40	34	368	282	13	40	34	368	0	0	0	0	0	14,319	639	2,021	1,731	18,709
June	381	31	88	120	10.41	0.00	6.67	7.35	332	0	45	74	451	317	0	43	70	429	16	0	2	3	21	16,098	0	2,203	3,647	21,948
July	381	31	88	120	11.13	0.00	13.24	10.51	356	0	105	107	570	332	0	84	84	455	24	0	24	23	101	16,862	0	4,289	4,252	25,527
August	381	31	88	120	10.45	0.00	11.71	9.47	333	0	96	95	523	288	0	83	82	453	45	0	13	13	58	14,650	0	4,207	4,167	23,024
September	381	31	88	120	8.53	0.00	8.87	7.09	255	0	75	70	397	255	0	72	70	397	0	0	0	0	0	12,938	0	3,681	3,567	20,186
October	381	31	88	120	5.47	0.00	3.46	3.25	174	0	28	32	234	174	0	28	32	234	0	0	0	0	0	8,824	0	1,432	1,647	11,902
November	381	31	88	120	2.87	1.29	1.29	0.00	82	3	11	0	96	82	3	11	0	96	0	0	0	0	0	4,166	169	535	0	4,869
December	381	31	88	120	1.33	1.33	1.33	0.00	82	3	11	0	97	82	3	11	0	97	0	0	0	0	0	2,166	176	562	0	2,872
Total					74.01	24.22	67.05	41.21	2,362	63	548	412	3,374	2,214	63	509	372	3,158	138	0	38	40	176	112,489	3,179	25,855	18,927	160,450
														App Rate	5.8	2.0	5.2	3.1	5.0	0.4	0.0	0.4	0.3	0.3					

Notes:

Total Acreage = 630 ac

(1) Irrigation demand determined by agronomist

(2) C = A x B / 12

(3) E = C - D

(4) F = D * 29.58 (Nitrogen concentration) x 8.3258 x 8.34

Crop	Area (ac/lbs)	Nitrogen Uptake (lbs/acre)	Allowable Nitrogen Application Loading (lbs)
Alfalfa	381	480	182,880
Oat Hay	31	115	3,565
Oat Hay/Sudan	88	490	43,120
Cotton	120	175	21,000
Total	630		250,565

Crop	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton
(1) Water Needed for Crop Demand (ac-ft/year)	2,362	63	548	412
(2) Nitrogen applied (lbs/year)	119,494	3,179	27,827	20,938
(3) Acres Planted per year (ac/year)	381	31	88	120
(4) Nitrogen Uptake Required by Crops (lbs/ac)	480	115	490	175
(5) Max. Nitrogen that can be applied (lbs/year)	182,880	3,565	43,120	21,000
(6) Excess Nitrogen available for Biosolids application	63,386	386	15,293	62

5 = (3 x 4)

6 = 5 - [ww N conc](0.3258)(8.34)

Wastewater Nitrogen Concentration (mg/L) 18.7

Supp. Water Nitrogen Concentration (mg/L) 0

Total N Applied from effluent used for Irrigation

Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)

Total N Applied from effluent used for Irrigation

Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)

APPENDIX F - 2014 WATER AND NITROGEN BALANCES

CROP PLAN 2014 (Crop Year)		
Field	**Acres**	**2011**
Reclamation/Dry Farmed Areas		(Nov 2013 - Oct 2014)
5N	20	Alfalfa
5S	20	Alfalfa
7	34	Alfalfa
8	18	Alfalfa
9	14	Alfalfa
10	32	Alfalfa
28B	19	Alfalfa
30	43	Alfalfa
31	23	Alfalfa
33	8	Alfalfa
34	21	Alfalfa
35	31	Alfalfa
46A	30	Alfalfa
160C	40	Alfalfa
Total	**353**	
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
28A	14	Oat Hay/Fallow
46B	17	Oat Hay/Fallow
Total	**281**	
32	57	Oat Hay/Sudan
160A	40	Oat Hay/Sudan
160B	40	Oat Hay/Sudan
160D	40	Oat Hay/Sudan
Total	**177**	
27	31	Cotton
29	38	Cotton
Total	**69**	
Grand Total	**880**	
Dry-Farmed Area		
17	40	Oat Hay/Fallow
18	20	Oat Hay/Fallow
19N	20	Oat Hay/Fallow
19S	20	Oat Hay/Fallow
20	53	Oat Hay/Fallow
21	32	Oat Hay/Fallow
22	30	Oat Hay/Fallow
23	20	Oat Hay/Fallow
25	15	Oat Hay/Fallow
Total	**250**	
Grand Total	**250**	

Appendix F	Water Balance - 2014 2010 Biosolids Management Five Year Plan City of Porterville						
			Effluent Ponds				
Month	WW Flow (mg) (A)	WW Flow (ac-ft) (B)	Precip. Gains (ac-ft) (C)	Evap. Loss (ac-ft) (D)	Irrig Schedule (ac-ft) (E)	Percolation Required (ac-ft) (F)	
January	142.7	437.9	18.17	4.91	83	368.5	
February	129.3	397.0	17.22	8.69	131	274.6	
March	146.3	449.1	17.22	15.86	216	234.3	
April	147.2	451.9	9.57	22.28	321	117.8	
May	155.5	477.4	4.78	31.35	365	85.8	
June	153.2	470.2	0.96	36.26	435	0.0	
July	159.0	487.9	0.00	37.77	450	0.0	
August	159.7	490.1	0.00	32.10	458	0.0	
September	151.7	465.6	1.91	23.79	407	36.6	
October	150.6	462.1	4.78	16.62	230	219.9	
November	140.8	432.0	9.57	7.93	98	335.7	
December	137.2	421.2	15.30	3.78	62	370.5	
Total (Rounded)	**1,773**	**5,442**	**99**	**241**	**3,257**	**2,044**	
			Overall Annual Perc. Rate (ft/yr) =			**40**	
(A) Based on a wastewater flow (B) = (A)*3.069 (C) Based on 51.5 acres of percolation area (D) Based on 51.5 acres of percolation area. (E) Planned irrigation usage. Acres Irrigated = (F) = (B) + (C) - (D) - (E)			**Assuming no losses to evap.due to rapid infilitration, perc rate increases to:**			**44**	
				630			

Appendix F — Irrigation Schedule - 2018
2009 Biosolids Management Five Year Plan
City of Porterville

Month	Crop Acreage (ac)				Irrigation Demand[1] (ac-in)				Water Needed for Crop Demand[2] (ac-ft)					Wastewater Application (ac-ft)					Supplemental Water Needed for Crop Demand[3] (ac-ft)					Nitrogen Loading due to Wastewater Application[4] (lbs)				
	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton	Total
			A				B				C					D					E					F		
January	353	31	177	69	1.77	1.77	1.77	0.00	52	5	26	0	83	33	5	26	0	63	0	0	0	0	0	2,685	232	1,327	0	4,244
February	353	31	177	69	2.80	2.80	2.80	0.00	82	7	41	0	131	82	7	41	0	131	0	0	0	0	0	4,185	368	2,098	0	6,651
March	353	31	177	69	4.48	4.87	4.87	0.00	132	13	72	0	216	132	13	72	0	216	0	0	0	0	0	6,696	639	3,650	0	10,985
April	353	31	177	69	4.63	7.29	7.29	0.00	195	19	108	0	321	195	15	108	0	321	0	0	0	0	0	9,910	937	5,464	0	16,330
May	353	31	177	69	6.87	4.87	4.87	3.41	261	13	72	20	365	261	13	72	20	365	0	0	0	0	0	13,258	639	3,650	996	18,543
June	353	31	177	69	10.47	0.00	5.97	7.35	396	0	82	42	432	315	0	83	42	439	-2	0	0	0	-2	16,739	0	4,198	2,161	22,898
July	353	31	177	69	11.17	0.00	13.24	10.71	329	0	155	62	546	263	0	110	43	416	77	0	45	14	137	12,537	0	7,630	2,495	22,672
August	353	31	177	69	10.49	0.00	11.71	9.47	309	0	153	54	535	286	0	168	47	456	65	0	25	8	73	12,403	0	7,502	2,366	22,270
September	353	31	177	69	5.02	0.00	8.87	7.02	238	0	131	48	457	238	0	131	42	407	0	0	0	0	0	11,087	0	6,648	2,051	19,786
October	353	31	177	69	6.47	0.00	3.48	3.24	181	0	51	19	230	181	0	51	19	230	0	0	0	0	0	8,176	0	2,586	947	11,709
November	353	31	177	69	2.57	1.29	1.29	0.00	76	3	19	0	98	76	3	19	0	98	0	0	0	0	0	3,643	168	967	0	4,777
December	353	31	177	69	1.33	1.33	1.33	0.00	39	3	20	0	62	39	3	20	0	62	0	0	0	0	0	1,868	175	992	0	3,035
Total					74.67	24.22	67.06	41.21	2,179	63	989	237	3,468	2,090	63	919	215	3,287	139	0	70	22	180	104,666	3,179	46,715	10,927	165,487
														App Rate	6.8	2.0	5.2	3.1	5.2	0.3	0.0	0.4	0.3	0.3					

Notes:
Total Acreage = 630.0

(1) Irrigation demands determined by agronomist.
(2) C = A x B/12
(3) E = C - D
(4) F = D x 23.55 (nitrogen concentration) x 0.3258 x 8.34

Crops	Area (acres)	Nitrogen Uptake (lbs/acre)	Allowable Nitrogen Application Loading (lbs)
Alfalfa	353	480	169,440
Oat Hay	31	115	3,565
Oat Hay/Sudan	177	440	77,880
Cotton	69	175	12,075
Total	630		262,960

Crop	Alfalfa	Oat Hay	Oat Hay/Sudan	Cotton
(1) Water Needed for Crop Demand (ac-ft/year)	2,179	63	989	237
(2) Nitrogen applied (lbs/year)	110,712	3,179	50,259	12,039
(3) Acres Planted per year (ac/year)	353	31	177	69
(4) Nitrogen Uptake Required by crops (lbs/ac)	480	115	440	175
(5) Max. Nitrogen that can be applied (lbs/year)	169,440	3,565	77,880	12,075
(6) Excess Nitrogen available for Biosolids application	58,728	386	27,621	36
5 x (2 x 4)				86,777
2 - 1 x (avg N conc)(0.3258)(8.34)				

Wastewater Nitrogen Concentration (mg/L)	18.7
Supp. Water Nitrogen Concentration (mg/L)	0
Total N Applied from effluent used for irrigation	
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)	
Total N Applied from effluent used for irrigation	
Nitrogen applied (lbs) = (acre-feet)(ww N conc)(0.3258)(8.34)	

APPENDIX G - 2015 WATER AND NITROGEN BALANCES

STATE WATER RESOURCES CONTROL BOARD
MONITORING AND REPORTING PROGRAM
GENERAL WASTE DISCHARGE REQUIREMENTS (WDRs) FOR THE DISCHARGE OF BIOSOLIDS TO LAND FOR USE IN AGRICULTURAL, SILVICULTURAL, HORTICULTURAL, AND LAND RECLAMATION ACTIVITIES

PRE-APPLICATION REPORT

As required in Provision 1.a. of the General Order, a Pre-Application Report shall be submitted for each field or distinct application area prior to the application of biosolids in accordance with the WDRs. Where biosolids are applied on a continuing basis to a single area, the Pre-Application Report may cover ongoing operations and may not need to be submitted for each load applied. A pre-application report shall be submitted 30 days prior to the date of the proposed application. The Pre-Application Report shall be signed by the owner/operator of the biosolids application operation and by the property owner. The property owner may submit written authorization to allow a representative of the property owner, such as a tenant or land management company, to sign the Pre-Application Report.

Information in the Pre-Application Report found in **bold type** is a required field to be submitted in the Pre-Application Report. Otherwise, information that was submitted in the Notice of Intent (NOI) and has not changed or will not change is not required. The following items shall be included in the Pre-Application Report and shall be submitted to the appropriate Regional Water Quality Control Board (RWQCB):

Waste Discharge Identification System No._____

This number is established at the time the initial Notice of Intent (NOI) is submitted to the RWQCB and can be obtained at the RWQCB.

1. Site Location/Applier Information-A separate Pre-Application Report must be completed for each different site.

Landowner:	
Address:	
Contact:	**Phone:**
Site Location (including address, if any):	
Nearest Cross Street(s):	
County:	**Total Size of Site:**
Section(s)/Township/Range/Meridian:	
Latitude (from field center):	**Longitude (from field center):**

Applier:	
Address:	
Contact:	**Phone:**

Attach a U.S. Geological Survey 7.5 Minute map or similar map (1:24000 or larger) showing the proposed application site and surrounding properties within 2,500 feet from site boundaries. The map should show:

a. Site topography
b. Run-on/runoff controls
c. Storage areas
d. Nearby surface waters, wells, residences, and public roads
e. Application area(s) including buffer zones (setbacks)
f. Ground water monitoring wells (if required)
g. Elevation

2. **Biosolids Source--** The section below must be completed **for each source of biosolids**. If additional space is required, copy this section and attach.

Wastewater Treatment Plant				
Mailing Address				
City	**County**	**State**	**Zip**	**Phone**
Contact Person				

Level of Pathogen Treatment: Class A_____ Class B_____
Description of vector attraction reduction achievement:

_____

3. **Constituent Concentrations (Each Source)**

Constituent	Concentration in Biosolids, mg/kg, dry weight
Arsenic	
Cadmium	
Copper	
Lead	
Mercury	
Molybdenum	
Nickel	
Selenium	
Zinc	
pH	
Salinity	
Total Solids Content	%
Total Nitrogen	
Fecal Coliform (if applicable)	MPN/gram

Ammonia Nitrogen, as N	
Total Phosphorus, as P	
Total Potassium	
SW 846[1] Method 8080 for PCB Aroclors, Aldrin/Dieldrin	
EPA Method 8270 Semi-Volatile Organics	

Date samples collected _____ _____
Date samples analyzed _____ _____
Attach copies of all lab reports.

4. Application Area Information

Subject	Value	Applicable Unit/ Type of Measure
Quantity of Biosolids to be Applied		
Land Use Zone		
Adjacent Land Use Zones		
Application Area Size		Acres
Proposed Nitrogen Loading		Lb. plant available nitrogen/acre
Residual Nitrogen from Previous Fertilizer and Biosolids Applications[10]		Lb. per acre
Proposed Crop, Use		
Crop Nitrogen Useage		
Nitrogen Usage Reference		
Anticipated Avg. Appl. Rate		
Avg. Annual precipitation		
Plant tissue testing for Molydenum(Mo) [11]		
Plant tissue testing for Copper(Cu)[3]		
Plant tissue testing for Selenium(Se)[3]		

Attach an anticipated annual time schedule for the field operations including anticipated biosolids applications windows, seeding operations, supplemental fertilization, and cultivation/harvest.

5. Ground Water Monitoring

For biosolids application operations where minimum depth to usable ground water[12] is less than 25 feet or as specified by the RWQCB Executive Officer and where special circumstances would warrant ground water monitoring, a ground

---

9 The Discharger shall use the most recent version of SW 486 methods for detecting PCB constituents and list all Aroclor concentrations with the summation of total PCBs.

10 Attach a sheet showing calculations and all assumptions used for calculating residual Nitrogen from previous fertilizer and biosolids applications.

11 The sample is a crop composite and only required where crops are used as animal feeds.

12 Usable ground water: Ground water is defined as having either an agricultural or domestic supply source as described in the RWQCB Basin Plan.

water monitoring program, at a minimum, shall consist of three monitoring wells (one up gradient, two down gradient) for each application area and shall be in place prior to any application of biosolids if the discharger intends to or does apply biosolids more than twice within a five-year period at any particular location. A report specifying location, construction, and development details of ground water monitoring wells shall be submitted to the RWQCB for approval by the RWQCB Executive Officer prior to the installation. In addition, a mean sea level (MSL) reference elevation shall be established for each well in order to determine water elevations. The RWQCB Executive Officer, after reviewing the information submitted, may waive this requirement if it is determined that the benefit of such monitoring is not commensurate to the level of protection.

Results shall be submitted to the RWQCB 30 days prior to any biosolids application at each site and annually thereafter. Samples shall be collected from each of the monitoring wells annually and shall be analyzed for the following parameters:

Parameter	Units
Static Water Level	feet (MSL)
Total Dissolved Solids	mg/L
Sodium	mg/L
Chloride	mg/L
Nitrate	mg/L as N
Total Nitrogen	mg/L as N
pH	pH units

Initial testing shall also include the following parameters:

Arsenic	mg/L
Cadmium	mg/L
Copper	mg/L
Lead	mg/L
Mercury	mg/L
Molybdenum	mg/L
Nickel	mg/L
Selenium	mg/L
Zinc	mg/L

6. Biosolids Storage Plan (as required by Storage and Transportation Spec. No. 8)

A biosolids storage plan must be attached (even if no *on-site* biosolids storage will be provided). The biosolids storage plan should include at a minimum:

If on-site storage will be provided:

a. Size of biosolids storage area
b. How frequently it will be used (emergency basis only or routine use)
c. Leachate controls
d. Erosion controls
e. Run-on/runoff controls

If no on-site storage will be provided:

a. Location of off-site storage facilities
b. Emergency storage plans

7. Erosion Control Plan (as required by Discharge Specification No. 8)

Biosolids applied to ground surfaces having a 10 percent or greater slope requires an Erosion Control Plan. The Plan should outline conditions that justify application of biosolids to the 10 percent or greater slopes and specify the application and management practices to be used to assure containment of the biosolids on the application site.

8. Spill Response and Traffic Plan (as required by Biosolids Storage and Transportation Specification No. 14)

a. The Spill Response Plan should include at a minimum:

(1) Emergency contacts and notification procedures.
(2) Personal protective equipment requirements.
(3) Response instructions for spill during biosolids transport.
(4) Response instructions for storage facility failure.
(5) Response instructions if hazardous or other unauthorized material is found.

b. The Traffic Plan should include at a minimum:

(1) The proposed route for all vehicles handling biosolids.
(2) The anticipated maximum vehicle weight.

9. Adverse Weather and Alternative Plan

Submit an Adverse Weather and Alternative Plan that details procedures to address times when biosolids cannot be applied to the site(s) due to adverse weather or other conditions (wind, precipitation, field preparation delays, access road limitations, etc.).

10. Land Productivity

A. Changes in Soil Fertility and Salinity and Resulting Effects on Productivity

"Attach a report from a certified soil scientist or a certified agronomist which evaluates the potential effects including potential nutrient imbalances, metals phytotoxicity, and excessive salinity on land productivity. The soil scientist and/or agronomist shall make recommendations, as deemed necessary, after considering the nature of the application site soils and biosolids characterization data and the need to preserve short term and long term land productivity. Those recommendations shall be reflected in the Pre-Application report regarding the proper rate of biosolids applications, any soil management

(such as supplemental fertilizers and pH adjustment), appropriate crop, and grazing practice recommendations."

B. Erosion Hazard Rating

The discharger shall submit an erosion hazard report (derived from USDA soil survey reports[13]) which assesses the proposed application site. The assessment will use the table below to determine whether soils could be degraded or land productivity reduced.

[13] Where a soils survey report is not available for a proposed application site, the applicant shall have a qualified soil scientist determine the erosion hazard (using NRCS guidelines), unless the slope of the site is 3% or less. Sites with slopes of 3% or less will be considered to have a slight erosion hazard.

Limitations to Land Application			
Parameter	Slight	Moderate	Severe
Cation exchange capacity[a] (average milliequivalents per 100 g, 0-20 inches depth)	>15	10-15	<10
pH[b] (average 0-20 inches depth)	>6.5	5.0 to 6.5	<5.0
Erosion hazard rating[c]	None to slight	Moderate	High to severe

[a] Cation exchange capacity limits based on professional judgment.
[b] pH limits based on U.S. Department of Agriculture (1993).
[c] Erosion hazard limits based on professional judgment.

Provided that the applicant, a soil scientist, or agronomist has provided written confirmation to the RWQCB that soils will not be degraded and/or land productivity will not be reduced as a result of nutrient imbalances, metals-related phytotoxicity, or adverse salinity effects, biosolids may be applied on any site having a "slight" limitation as defined in the table. At sites having a "moderate" limitation, biosolids may be applied only where the crop is not known to be particularly sensitive to metals and nutrient imbalances or is not known to be bioaccumulative of heavy metals. Sites having a "severe" limitation are excluded from eligibility under the GO. Sites with a slope of greater than 20% shall not accept biosolids unless those sites will be immediately covered by sod or a sufficient mulch cover to control erosion.

11. A biological site assessment is required in areas where natural terrestrial habitat (previously undisturbed lands) and fallow lands (as defined in Findings No. 3m in the General Order) exist and are planned for biosolids applications. The assessment shall be conducted to identify any special-status plant and wildlife species onsite, submitted as part of the Pre-Application Report, and shall be conducted by a qualified biologist. This report must be forwarded to the appropriate regional office of the DFG and the Endangered Species Unit of the USFWS in Sacramento for review and approval of the mitigation strategy, as appropriate. If there are no special-status species present, RWQCB may continue with the project evaluation. If special-status species could be affected, the project will not be authorized under the GO unless the applicant submits a plan to mitigate for any significant impacts on special-status species, obtains the appropriate permits, and agrees to implement the mitigation.

ANNUAL REPORTING

1. **Ground Water Monitoring** (if required in the Pre-Application Report)

Samples shall be collected from each of the monitoring wells annually and shall be analyzed for the following parameters:

Parameter	Units
Static Water Level	feet (MSL)
Total Dissolved Solids	mg/l
Sodium	mg/l
Chloride	mg/l
Nitrate	mg/l as N
Total Nitrogen	mg/l as N
pH	pH units
Arsenic (As)	mg/l
Selenium (Se)	mg/l
Molybdenum (Cu)	mg/l

2. **Application Information**

Quantity of Biosolids Applied		Dry tons
Application Area Size		Acres
Total Nitrogen Concentration in Biosolids		mg/kg
Nitrogen Loading		Lb. plant avail. Nitrogen per acre
Residual Nitrogen[14]		Lbs. per acre
Crop		
Amount of Crop Produced		Specify units
Plant tissue testing for Molybdenum (mo)[6]		
Plant tissue testing for Copper (cu),[6]		
Plant tissue testing for Selenium (Se)[15]		

[14] As determined by field soil nitrogen testing in an 18 inch depth.

[15] Crop composite and only required where crops are used as animal feeds.

3. **Pollutant Loadings for Each Application Site**

Pollutant	Total Loadings from Previous Years (kg/ha)	Loading This Year (kg/ha)	Background Soils Conc. (kg/ha) (6" depth)	Cumulative Metal Load to Date (kg/ha)	Percent Cumulative Limit to Date
Arsenic					
Cadmium					
Copper					
Lead					
Mercury					
Molybdenum					
Nickel					
Selenium					
Zinc					

4. **Constituent Concentrations (Each Source)**

Constituent	Concentration in Biosolids, (mg/kg, dry weight)
Arsenic	
Cadmium	
Copper	
Lead	
Mercury	
Molybdenum	
Nickel	
Selenium	
Zinc	
Total Solids Content	%
Total Nitrogen	
Fecal Coliform	MPN/gram
Ammonia Nitrogen, as N	
Total Phosphorus, as P	
Total Potassium	
SW 846[16] Method 8080 for PCB Aroclors, Aldrin/Dieldrin	
EPA Method 8270 Semi-Volatile Organics	

5. **Site Map**

Provide a site map identifying the area(s) of application clearly showing each field to which biosolids have been applied and crop planted.

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[16] The discharger shall use the most recent version of SW 486 methods for detecting PCB constituents and list all Aroclor concentrations with the summation of total PCBs.

6. **40 CFR Part 503**

Attach a copy of the generator's monitoring report for compliance with the 40 CFR Part 503.

GENERAL REPORTING

1. Pre-Application Reports shall be submitted for RWQCB staff review and approval at least 30 days prior to application of biosolids. Annual Reports covering the period between January 1 to December 31 shall be submitted by February 15 of the following year. If no applications occurred during the year, the discharger shall submit a report indicating that no discharge occurred during the year.

2. The collection, preservation and holding times of all samples shall be in accordance with U.S. Environmental Protection Agency approved procedures. A laboratory certified by the California Department of Health Services to perform the required analyses shall conduct all analyses, except soil nitrogen and plant tissue samples for selenium, copper and molybdenum. Analysis for soil nitrogen and plant tissue concentrations of selenium and molybdenum shall participate in a program similar to the North American Proficiency Testing Program (NAPT) operated by the Soil Science of America. The RWQCB Executive Officer may allow use of an uncertified laboratory in accordance with Provision 18.

3. If there is no discharge during a required reporting period, the discharger shall submit a letter report to the RWQCB indicating that there has been no activity during the required reporting period.

4. Each report shall be signed and contain the following certification:

   "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment"

5. A duly authorized representative of the discharger may sign the documents if:

   a. The authorization is made in writing by the person described above;

   b. The authorization specified an individual or person having responsibility for the overall operation of the regulated disposal system; and

   c. The written authorization is submitted to the RWQCB Executive Officer.

6. The discharger shall arrange the data in tabular form so that the specified information is readily discernible. The data shall be summarized in such a manner as to clearly illustrate whether the facility is operating in compliance with waste discharge requirements.

7. Report immediately (within 24 hours) to the RWQCB Executive Officer and Director of County Environmental Health by telephone with a follow-up letter any discharge which threatens the environment or human health. During non-business hours, report to the Office of Emergency Services by telephone at 1-800-852-7550.

8. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the RWQCB.

State of California

State Water Resources Control Board

NOTICE OF INTENT

TO COMPLY WITH THE TERMS OF GENERAL PERMIT ORDER NO . 2000-___-DWQ
FOR THE DISCHARGE OF BIOSOLIDS TO LAND
FOR USE IN AGRICULTURAL, SILVICULTURAL, HORTICULTURAL AND LAND RECLAMATION ACTIVITIES

ATTACHMENT A

Mark Only One Item	1. ☐ New Discharge Under MODEL Permit 2. ☐ Change of Information-WDID #

I. Property Owner (Required)

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person		(check one) Owner _____ Operator _____ Owner/operator _____		

II. Generator (Required . If more than one generator, attach the information and ensure that the signature block is copied, signed and attached.)

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person				

III. Site Operator/Property Manager (if any)

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person				

IV. Billing Address

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person				

STATE USE ONLY

WDID: ☐☐☐☐☐☐☐☐☐☐	Regional Board Office: ☐☐	Date NOI Received: _____	Date NOI Processed: _____
	Fee Amount Received: $ _____	Check #: _____	

V. Site Operator

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person				

VI. Hauler Information

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person				
Type of Transportation				

VII. Site Location

Street (including address, if any)	
Nearest Cross Street(s)	
County:	Total Size of Site (acres):
Township/Range/Section	T _____, R _____, Section _____, ___ ___B&M
Latitude/Longitude (From Center): _____ Sec. W	_____ Deg. _____ Min. _____ Sec N. _____ Deg. _____ Min.

Attach a map of at least 1:24000 (1" = 2000') showing the proposed application site (e.g., USGS 7.5' topographic map). The map should also show run-on/runoff controls, storage areas, nearby surface waters, wells and residences, the application areas including setback and buffer zones .

VIII. Application Area Information

Subject	Value	Applicable Unit/ Type of Measure
Quantity of Biosolids to be Applied		dry tons per year
Total Biosolids Application Proposed		dry tons
Land Use Zone		
Adjacent Land Use Zones		
Application Area Size		acres
Proposed Nitrogen Loading		lb. Plant Available Nitrogen/acre
Proposed Crop, Use		crop type, human/animal/neither
Crop Nitrogen Usage		1b. Nitrogen/year
Nitrogen Usage Reference		
Depth of Root Zone for Crop Being Planted		inches
Will Setback Limits Be Met?		Yes or No
Distance to Nearest Inhabited Dwelling		feet/miles
Public Access Controls		Specify Type
Runoff Controls		Attach plans
Prevailing Wind Direction		
Minimum Depth to Ground Water		feet
How Minimum Depth to Ground Water is Determined		

Anticipated Average Daily Application Rate		dry tons/day
Source of Water for Crop		
Average Annual Precipitation		inches/year

Attach an anticipated annual time schedule for the field operations including anticipated biosolids applications windows, seeding operations, supplemental fertilization, and cultivation/harvest.

IX. Soil Constituent Concentrations (Each Source)

Constituent	Concentration in Soil, mg/kg, dry weight
Arsenic	
Cadmium	
Copper	
Lead	
Mercury	
Molybdenum	
Nickel	
Selenium	
Zinc	
pH	
Estimated Permeability	cm/sec
Cation Exchange Capacity	meq/100g
Total Nitrogen	
Ammonia Nitrogen, as N	
Total Phosphorus, as P	
Total Potassium	

X Have any proposed biosolids application sites been fallow for more than one year? ☐ YES ☐ NO

XI Are there existing agricultural, silvicultural, or horticultural operations at all the proposed application sites? ☐ YES ☐ NO

XII Is it known whether any locations within the proposed land application site contain biologically unique or sensitive natural communities? ☐ YES ☐ NO

If natural terrestrial habitats are present on the project site, a biological site assessment must be conducted to determine whether biologically unique or sensitive natural communities occur and whether they could be disturbed by the application of biosolids; this report must be forwarded to the appropriate regional office of DFG and the Endangered Species Unit of the USFWS in Sacramento for review and approval of the mitigation strategy, as necessary. If biologically unique or sensitive natural communities are present and more than 10% or 10 acres will be disturbed, whichever is less, the project will not be authorized under the GO unless the applicant submits a plan to mitigate for any significant impacts on biologically unique or sensitive natural communities and agrees to implement the mitigation.

XIII Biosolids Storage Plan (as required by Biosolids Storage and Transportations Spec. No. 8)

A biosolids storage plan must be attached (if no *on-site* biosolids storage will be provided, a contingency plan for inclement weather operation must be provided). The biosolids' storage plan should include at a minimum:

If on-site storage will be provided:

a. Size of biosolids storage area
b. How frequently it will be used (emergency basis only or routine use)
c. Leachate controls
d. Erosion controls
e. Run-on/runoff controls

If no on-site storage will be provided:

a. Location of off-site storage facilities

b. Emergency storage plans

XIV Erosion Control Plan (if applicable) (as required by Discharge Specification No. 8)

Biosolids applied to ground surfaces having a 10 percent or greater slope requires an Erosion Control Plan. The Plan should outline conditions that justify application of biosolids to the 10 percent or greater slopes and specify the application and management practices to be used to assure containment of the biosolids on the application site.

XV. Spill Response and Traffic Plan (as required byBiosolids Storage and Transportation Spec. No. 14)

a. The Spill Response Plan should include at a minimum:

1. Emergency contacts and notification procedures
2. Require personal protective equipment requirement
3. Response instructions for spill during biosolids transport
4. Response instructions for storage facility failure
5. Response instructions if hazardous or other unauthorized material is found

b. The Traffic Plan should include at a minimum:

1. The proposed route for all vehicles handling biosolids
2. Describe the anticipated maximum vehicle weight

XVI. Adverse Weather and Alternative Plan: (as required by Biosolids Storage and Transportation Spec. No. 8)

Submit an Adverse Weather and Alternative Plan that details procedures to address times when biosolids cannot be applied to the site(s) due to adverse weather or other conditions (wind, precipitation, field preparation delays, access road limitations, etc).

XVII. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment." In addition, I certify that the provisions of the permit, including the criteria for eligibility, will be complied with.

Signature of Owner/Operator of Spreading Operations	Title
Printed or Typed Name	Date
Signature of Property Owner	Title
Printed or Typed Name	Date
Signature of Site Operator/Manager (if any)	Title
Printed or Typed Name	Date

State of California
State Water Resources Control Board

NOTICE OF TERMINATION

TO COMPLY WITH THE TERMS OF GENERAL PERMIT ORDER NO. 2000-___-DWQ
FOR THE DISCHARGE OF BIOSOLIDS TO LAND
FOR USE IN AGRICULTURAL, SILVICULTURAL, HORTICULTURAL AND LAND RECLAMATION ACTIVITIES

ATTACHMENT B

WDID #

I. Property Owner

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person				

II. Generator

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person				

III. Owner/Operator of spreading operations

Name				
Mailing Address				
City	County	State	Zip	Phone
Contact Person		(check one) Owner _____ Operator _____ Owner/operator		

IV. Site Operator/Property Manager (if any)

Name				
Mailing Address		Contact Person		
City	County	State	Zip	Phone

V. Billing Address

Name				
Mailing Address		Contact Person		
City	County	State	Zip	Phone

VI. Hauler Information

Name	
Mailing Address	

City	County	State	Zip	Phone

VII. Site Location

Street (including address, if any)	
Nearest Cross Street(s)	
County:	Total Size of Site (acres):

Township/Range/Section T _____, R _____, Section _____, ___ ___B&M

Latitude/Longitude (From Center): _____ Deg. _____ Min. _____ Sec N. _____ Deg. _____ Min. _____ Sec. W

Attach a map of at least 1:24000 (1" = 2000') showing the proposed application site (e.g., USGS 7.5" topographic map). The map should also show run-on/runoff controls, storage areas, nearby surface waters, wells and residences, the application areas including setback and buffer zones .

VIII. Application Area Information

Subject	Value	Applicable Unit/ Type of Measure
Quantity of Biosolids Applied		dry tons per year
Application Area Size		acres
Nitrogen Loading		lb. Plant Available Nitrogen/acre
Crop, Use		crop type, human/animal/neither
Crop Nitrogen Usage		1b. Nitrogen/year
Nitrogen Usage Reference		
Last Date of Class B Biosolids Application		Date
Public Access Controls		Specify Type

IX. Attached is the Annual Monitoring and Reporting Report for th☐ current☐ ar. Yes No

X. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment." In addition, I certify that the provisions of the permit, including the criteria for eligibility, will be complied with.

Signature of Generator	Title
Printed or Typed Name	Date
Signature of Property Owner	Title
Printed or Typed Name	Date
Signature of Site Operator/Manager (if any)	Title
Printed or Typed Name	Date

STATE USE ONLY

WDID: ☐☐☐☐☐☐☐☐☐☐	Regional Board Office: ☐☐	Date NOI Received: _____	Date NOI Processed: _____
	Fee Amount Received: $ _____	Check #: _____	

5. Copy of Water Reclamation Requirements WRR 5-01-246 as adopted 19 OCT 2001

Clarification of
Water Reclamation Requirement
(WRR) 5-01-246

The California Regional Water Quality Control Board approved the Water Reclamation Requirement (WRR) 5-01-246 for the City of Porterville on October 19, 2001. The WRR's purpose is to establish the standards, prohibitions, specifications, provisions, and monitoring of all the activities involving the reclamation area. The City, with the assistance of the Lessee, will account for all activities in the reclamation area including, but not limited to, irrigation rates, application of biosolids, cropping schedule, soil testing, tissue analysis, fertilizer application, soil amendment application and crop yields.

The WRR was promulgated in October 2001, since then the reclamation area has gone through many changes including, but not limited to, changes in field APN numbers, acreage totals, land ownership, farm manager, average daily effluent flow totals, cropping schedule and annual digested sludge totals.

For the most accurate information regarding the above mentioned changes to the Reclamation Area, refer to relevant sections of the RFP and utilize the WRR as the document that establishes the standards, prohibitions, specifications, provisions, and monitoring requirements.

California Regional Water Quality Control Board

Central Valley Region

Robert Schneider, Chair

Winston H. Hickox
Secretary for Environmental Protection

Gray Davis
Governor

Fresno Branch Office
Internet Address: http://www.swrcb.ca.gov/~rwqcb5
3614 East Ashlan Avenue, Fresno, California 93726
Phone (559) 445-5116 • FAX (559) 445-5910

20 November 2001

CERTIFIED MAIL
70010360000298713832

Mr. Michael Unser, Director of Community
and Development Services
City of Porterville
P.O. Box 432
Porterville, CA 932458

TRANSMITTAL OF ADOPTED ORDER FOR CITY OF PORTERVILLE AND ROBERT NUCKOLS, RECLAMATION PROJECT, TULARE COUNTY

Enclosed is an official copy of Order No. 5-01-246 as adopted by the California Regional Water Quality Control Board, Central Valley Region, at its 19 October 2001 meeting.

Jo Anne Kipps

JO ANNE KIPPS
Senior Engineer
RCE No. 49278

Enclosure Water Reclamation Requirements
Standard Provision (Discharger only)

cc: Ms. Catherine George, Office of Chief Counsel, State Water Resources Control Board, Sacramento
Mr. Jim Kassel, Division of Water Quality, State Water Resources Control Board, Sacramento
Department of Water Resources, San Joaquin District, Fresno
Mr. Richard Haberman, California Department of Health Services, Fresno
Tulare County Environmental Health Services, Visalia

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. 5-01-246

WATER RECLAMATION REQUIREMENTS FOR CITY OF PORTERVILLE AND ROBERT NUCKOLS RECLAMATION PROJECT TULARE COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

1. Mr. Robert Nuckols (hereafter User) reclaims secondary treated wastewater from the City of Porterville Wastewater Treatment Facility (WWTF) on 573 acres of cropland owned by the User and of 20 acres of cropland leased from the Tule River Tribal Council.

2. Wastewater Reclamation Requirements Order No. 86-193, adopted by the Board on 26 September 1986 for the City of Porterville and Robert Nuckols, prescribes requirements for reclamation of treated wastewater on 1,100 acres of croplands. Currently, 768 acres (hereafter use area) are available for reclamation. The use area consists of the 220 acres owned or leased by the User (hereafter designated use area) and the 508 acres owned by the City of Porterville (hereafter Producer). Requirements regarding reclamation of wastewater on the City-owned land are currently included in Waste Discharge Requirements Order No. 5-01-103 for the City of Porterville, adopted by the Board on 27 April 2001. The User manages the entire 768-acre use area and reportedly reclaims WWTF effluent on only 300 to 500 acres of the use area.

3. The designated use area is in portions of Sections 5, 6, 7, and 8 of T22S, R27E, MDB&M, as shown in Attachment A, which is attached hereto and part of this Order by reference.

4. Order No. 86-193 is subject to and due for periodic review. The purpose of this Order is to rescind the previous Order and update waste discharge requirements, in part, to ensure the discharge is consistent with Board plans and policies and to prescribe requirements that are effective in protecting existing and potential beneficial uses of receiving waters.

5. The designated use area is one mile west and three miles south of the WWTF. The concrete-lined Friant-Kern canal borders the designated use area to the west. The Tule River is about one mile north of the designated use area and Deer Creek is about two and one half miles south of the designated use area.

6. Order No. 5-01-103 limits the discharge to 5.35 million gallons per day (mgd) which is less than the treatment design capacity of 8.0 mgd. Current flows are 4.35 mgd of which the producer supplies 25 percent to the user for recycling. About 25 percent of this wastewater is reclaimed. The WWTF is designed to supply 8.0 mgd of treated wastewater.

7. The User grows fodder and fiber crops at the use area. The crops are furrow and flood irrigated.

8. Monitoring data submitted by the Producer indicates that the WWTF effluent has an EC (conductivity at 25°C) of about 800 µmhos/cm and nitrate-nitrogen concentration of about 14 mg/L.

9. The WWTF produces about 450 tons of digested sludge per year. This is applied on portions of the designated use area. The nitrogen loading of the designated use area from wastewater is approximately 160 lbs/acre/year. The nitrogen loading from sludge application is 0 to 40 lbs/acre/year. The User also applies commercial fertilizers on the designated use area at the rate of 60 to 120 lbs/acre/year. The combined nitrogen loading on the use area may to be excessive as fodder and fiber crop utilize only 100 to 480 lbs/acre/year of nitrogen.

10. In 1993, the Producer submitted to the Board a report on hydraulic and nutrient management at the designated use area. The report indicates that the User's application of wastewater and nitrogen is less than the crop water and nutrient requirements.

11. In 1993, the Producer established a groundwater monitoring network in the use area consisting of one upgradient well (MW101) and three downgradient wells (MW102, MW103, MW104). Quarterly groundwater monitoring data since 1993 shows that groundwater passing through downgradient monitoring wells at the WWTF, reclamation area, and disposal field has higher concentrations of nitrate-nitrogen, EC, total dissolved solids (TDS), chloride, calcium, and sodium than background levels (i.e., as determined by upgradient monitoring wells).

12. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*, (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin, and incorporates by reference plans and policies of the State Water Resources Control Board. These requirements implement the Basin Plan.

13. The use area lies within the Tule Delta Hydrologic Area (No. 558.20), as depicted on interagency maps prepared by the California Department of Water Resources in August 1986. The area slopes at approximately 8 feet/1000 feet with surface water drainage to Old Deer Creek.

14. The beneficial uses of the Tule River below Lake Success are municipal, industrial and agricultural supply, water contact and noncontact water recreation, warm freshwater habitat, wildlife habitat, and groundwater recharge.

15. Some soils at the use area are medium to fine textured with hardpan and restricted subsoil drainage. Soil permeabilities reportedly are low in these areas of the use area. However, the use area contains soils with highly variable permeability rates.

16. The depth of groundwater at the use area varies between 40 to 80 feet below ground surface.

17. The beneficial uses of groundwater in the area are municipal, industrial, and agricultural supply.

18. The California Department of Health Services (DHS) has established statewide criteria in Title 22, California Code of Regulations (CCR), section 60301 et seq., (hereafter Title 22) for the use of recycled water and has developed guidelines for specific uses. The 1988 Memorandum of Agreement (MOA) between DHS and State Water Resources Control Board on use of reclaimed water establishes basic principles relative to the agencies hereto and the regional boards. In addition, the MOA allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to the use of reclaimed water in California.

19. The Producer has submitted to DHS an engineering report on (Title 22 Report) 19 August 1998 regarding reclamation; DHS approved the report.

20. The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA) in accordance with Title 14, California Code of Regulations (CCR), section 15301.

21. The permitted discharge is consistent with the antidegradation provisions of State Water Resources Control Board Resolution No. 68-16. The proposed Order requires that effluent, WWTF sludge, and chemical fertilizers be applied at rates not exceeding crop agronomic rates. The proposed Order further contains conditions typical of those imposed on agricultural reclamation activities, including setback distances for the use of reclaimed water.

22. The Board has notified the Producer, User, interested agencies and persons of its intent to prescribe water reclamation requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

23. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that Water Reclamation Requirements Order No. 86-193 is rescinded and the City of Porterville and Robert Nuckols, their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Reclaimed Water Prohibitions

1. Discharge of reclaimed water to surface waters or surface water drainage courses, either by runoff or direct discharge from the designated use area, is prohibited.

2. Cross-connections between any potable water supply and piping containing recycled water is prohibited. As such, no physical connection shall exist between recycled water piping and any domestic water supply well, or between recycled water piping and any irrigation well that does not have an air gap or reduced pressure principle device. All users of recycled

water shall provide for appropriate backflow protection for potable water supplies as specified in Title 17, CCR, section 7604, or as specified by DHS.

3. Application of recycled water shall be applied to approved use areas during periods when soils are saturated is prohibited.

4. Application of recycled water so as to cause runoff to and degradation of any water body of wetland is prohibited.

5. Application of recycled water so as to cause escape from the approved use areas as an airborne spray that would visibly wet vegetation or any other surface is prohibited.

6. Application of recycled water so as to cause rising groundwater discharging to surface waters to impair surface water quality objectives or beneficial uses is prohibited.

7. Use of recycled water as a domestic or animal water supply is prohibited.

B. Recycled Water Specifications

1. The reclaimed water shall remain within the designated conveyance facilities and the approved use areas, as defined in Finding No. 3, at all times and shall be managed to minimize erosion and runoff from the use areas.

2. Reclamation shall be limited to furrow and flood irrigation of fodder/and or fiber crops.

3. Use of recycled water as permitted by this Order shall comply with the terms and conditions of the most current Title 22 regulations.

4. Public contact with recycled water shall be precluded through such means as fences or acceptable alternatives. Signs with proper wording (shown below) of a size no less than four inches high by eight inches wide shall be place at all areas of public access and around the perimeter of all areas used of effluent disposal or conveyance to alert the public of the use of recycled water. All signs shall display an international symbol similar to that shown in Attachment B and present the following wording:

"RECYCLED WATER – DO NOT DRINK"
"AGUA DE DESPERDICIO RECLAMADA –POR FAVOR NO TOME"

5. *Operational Procedures for Recycled Water*, as shown in Attachment C (or any subsequent revision subject to Executive Officer approval), shall be complied with at all times.

6. The User shall maintain the following setback distances from areas irrigated with reclaimed water:

Setback Distances (feet)	To
25	Property Line
30	Public Roads
50	Drainage Courses
100	Irrigation Wells
100	Domestic Wells

7. The User shall not irrigate with reclaimed water during periods of heavy rainfall or when the ground is saturated.

8. The use area shall be managed to prevent breeding of mosquitoes. More specifically:

   a. All reclaimed water applied to furrows must infiltrate completely within a 48-hour period.

   b. Ditches must be maintained free of emergent, marginal, and floating vegetation.

   c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store water.

9. The perimeter of the use areas shall be graded to prevent ponding along public roads or other public areas.

10. Recycled water shall be managed to minimize contact with workers.

11. Application of recycled water to approved use areas shall be at reasonable agronomic rates considering the crops, soil, climate, and irrigation management system. The nutrient loading of the use areas, including the nutritive value of organic and chemical fertilizers and of the recycled water, shall not exceed the crop demand.

C. Provisions

1. The User shall submit technical reports as directed by the Executive Officer.

2. The User shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as *Standard Provision(s)*. For the purposes of this Order, "discharger" and "permittee" as used in Standard Provisions shall mean "User," "disposal" shall mean "reclamation," and "disposal area" as well as "facility" shall mean "use area."

3. The User shall comply with the attached Monitoring and Reporting Program No. 5-01-246 and any revisions thereto as ordered by the Executive Officer.

4. The use of reclaimed water shall comply with the provisions of Title 22. Further, the User must obtain written approval from the Executive Officer prior to use of reclaimed water for uses other than those listed in Reclaimed Water Specification B.2.

5. The Producer/User shall ensure that the sale of approved grain crops as a food crop for human consumption is prohibited.

6. The Producer and User shall maintain in good working order and operate as efficiently as possible any facility or control system installed by the Producer or User, respectively, to achieve compliance with these waste discharge requirements.

7. The Recycled Water Supervisor shall be responsible for the avoidance of cross-connections during the installation, operation and maintenance of the Use Area's pipelines and equipment.

8. The Producer and User shall assure that all above ground equipment, including pumps, piping, canals, and valves, etc., which may at any time contain recycled water, are adequately and clearly identified with appropriate warning signs.

9. This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the Producer and/or User from liability under Federal, State, or local laws, and do not create a vested right to continue reclamation.

10. If any condition or criteria set forth in this Order conflicts or is inconsistent with any requirement set forth in any State regulation, the more stringent condition or criterion shall apply.

11. Regional Board staff may conduct annual inspections and/or audits of the reclamation project and conduct periodic spot field inspections of approved use areas.

12. All conditions of these waste discharge requirements must be complied with at all times. Violations may result in enforcement action, including Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

13. In the event of any change in control or ownership of land or waste discharge facilities described herein, the User shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain

the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved by the Executive Officer.

14. To demonstrate compliance with Reclaimed Water Specifications B.3 and B.10 (a), the User shall submit an irrigation management plan by 120 days of adoption of this Order. Alternately, the Producer may prepare and submit an irrigation management plan that addresses compliance with said requirements.

    The irrigation management plan shall describe the acreage of various types of crops to be grown and harvested annually, crop water use, and nitrogen uptake data. The plan must include a monthly water balance, with storage requirements, and a nitrogen balance (taking into consideration all sources of nitrogen), and must demonstrate that reclamation can be accomplished in accordance with accepted irrigation practices and without contributing significant additional nitrogen to ground water. The plan shall also include a map showing locations of all domestic and irrigation wells that are close to the use area, areas of public access, location and wording of public warning signs. The plan shall describe how setback distances of Reclaimed Water Specification B.5 will be maintained. Moreover, the plan shall be subject to the review and approval of the Executive Officer. The User shall comply with the approved plan.

15. The Board will review this Order periodically and will revise requirements when necessary.

16. A copy of this Order shall be available at the use area and the User shall ensure that key operating personnel are familiar with its contents.

17. The User must comply with all conditions of these wastewater reclamation requirements. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of these water reclamation requirements by the Board.

I, GARY M. CARLTON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 19 October 2001.

for GARY M. CARLTON, Executive Officer

BLH:JLK:10/19/01

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. 5-01-246
FOR
CITY OF PORTERVILLE AND ROBERT NUCKOLS
RECLAMATION PROJECT
TULARE COUNTY

CROP AND RECLAIMED WATER MONITORING

The type of crop(s) irrigated, amounts of water and/or reclaimed water applied to the crops(s) in each parcel (in acre-feet) and amounts of chemical fertilizer (in pounds of nitrogen per acre) applied at each parcel shall be measured and reported to the Board quarterly in accordance with the following schedule:

Monitoring Period	Reports Due
January - March	1 May
April - June	1 August
July - September	1 November
October - December	1 February

By 1 February of each year, the User shall submit a letter report to the Executive Officer containing the names and telephone numbers of persons to contact regarding use of reclaimed water.

The User may also be requested to submit an annual report to the Board with tabular summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The User shall utilize the attached form (or variation thereof subject to Board staff approval) for reporting the monitoring data.

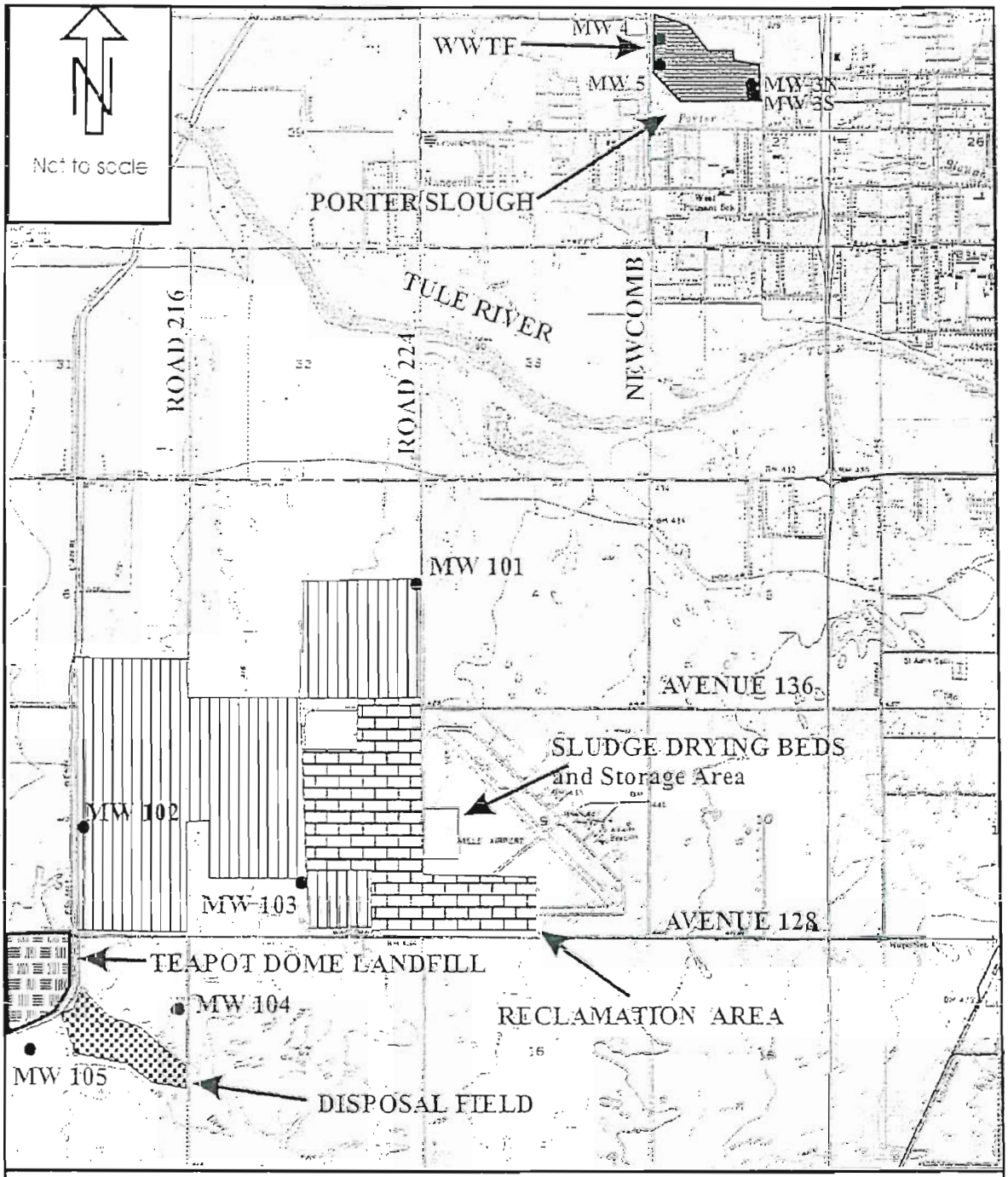
Monitoring reports shall utilize Attachment D, Use Area Monitoring Data. All reports submitted in response to this Order shall comply with the signatory requirements in Standard Provision B.3.

The User shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by: _____
for GARY M. CARLTON, Executive Officer

19 October 2001
(Date)

BLH:jlk:10/19/01



ATTACHMENT A
Vicinity Map & Groundwater Monitoring Wells

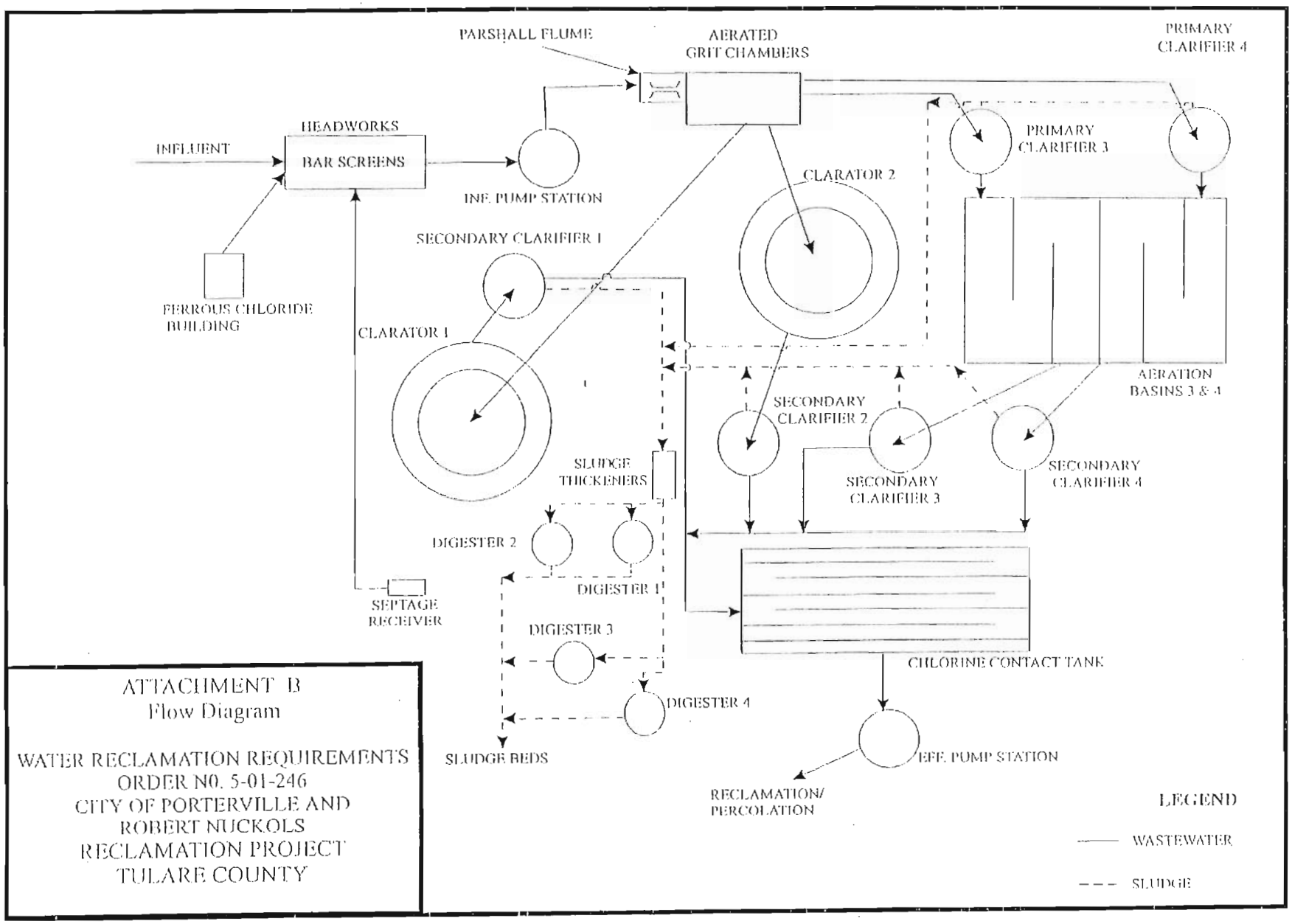
WATER RECLAMATION REQUIREMENTS ORDER Number 5-01-246
CITY OF PORTERVILLE AND ROBERT NUCKOLS
RECLAMATION PROJECT
TULARE COUNTY

LEGEND

Owned by Robert Nuckols

Owned by City of Porterville

Section 21, T21S, R27E, MDB&M
Section 8, 9, and 18, T22S, R27E MDB&M
Porterville 7.5' USGS QUAD.



ATTACHMENT B
Flow Diagram

WATER RECLAMATION REQUIREMENTS
ORDER NO. 5-01-246
CITY OF PORTERVILLE AND
ROBERT NUCKOLS
RECLAMATION PROJECT
TULARE COUNTY

WATER RECLAMATION REQUIREMENTS ORDER NO. 5-01-246
FOR
CITY OF PORTERVILLE AND ROBERT NUCKOLS
RECLAMATION PROJECT
TULARE COUNTY

ATTACHMENT C
Operational Procedures for Recycled Water

1. The discharge of reclaimed water to surface waters or surface water drainage courses, either by direct discharge or runoff from the reclamation area, is prohibited.

2. Reclaimed water shall remain within the approved reclamation area at all times.

3. The use of reclaimed water shall be limited to irrigation of fodder, fiber, and seed crops for nonhuman consumption.

4. There shall be no irrigation or impoundment of reclaimed water within 50 feet of any irrigation well or within 100 feet of any domestic well.

5. The perimeter of the reclamation area shall be graded to prevent ponding along public roads or other public areas.

6. Reclaimed water shall not be applied within 30 feet of public roads.

7. Signs with proper wording of sufficient size shall be placed at areas of access and around the perimeter of all areas used for effluent disposal to alert the public of the use of reclaimed water.

8. Areas irrigated with reclaimed water shall be managed so as to prevent brooding of mosquitoes. More specifically:

   a. Tail water must be returned. All irrigation water must infiltrate completely within a 48-hour period.

   b. Ditches must be maintained free of emergent, marginal, and floating vegetation.

   c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store reclaimed water.

9. Reclaimed water shall be managed to prevent runoff onto adjacent properties not owned or controlled by the User.

10. The use of reclaimed water must comply with the reclamation requirements of Title 22.

11. The use of reclaimed water shall not cause a nuisance or pollution as defined by the California Water Code, Section 13050.

12. Supplementing reclaimed water by connection with a domestic drinking water source or an irrigation or industrial well requires an air gap device or backflow prevention device that complies with Title 17, California Code of Regulations, Section 7583, et seq.

13. All reasonable steps shall be taken to minimize or prevent any discharge, which has reasonable likelihood of adversely affecting human health. In such an event; the User shall orally report the circumstances to the regional Board within 24 hours from the time of discovery. Personnel employed to manage irrigation shall be advised of the source of the reclaimed water and appropriate precautions during handling.

14. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property; do not protect the User from liability under Federal, State, or locals, and do not create a vested right to continue reclamation.

WATER RECLAMATION REQUIREMENTS ORDER NO. 5-01-246
CITY OF PORTERVILLE AND ROBERT NUCKOLS
RECLAMATION PROJECT, TULARE COUNTY
ATTACHMENT D

City of Porterville & Robert Nuckols Reclamation Monitoring Data
For Year: _____

Parcel No. _____ of _____ acres

		Water application				Nitrogen application		
		Water required	Effluent used	Other water used	Total irrigation water	As fertilizer	As effluent*	Total nitrogen applied
Month	Crop	(AF)	(AF)	(AF)	(AF)	(lbs/acre)	(lbs/acre)	(lbs/acre)
October								
November								
December								
Subtotal:								
January								
February								
March								
Subtotal:								
April								
May								
June								
Subtotal:								
July								
August								
September								
Subtotal:								
Annual Total:								

* calculated as (AF effluent/acre) x (2.72) x (X mg/l nitrate-nitrogen) = lbs nitrogen/acre

Additional Comments: _____

_____

_____

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Submitted By: _____

(Signature and Date)

INFORMATION SHEET

ORDER NO. 5-01-246
CITY OF PORTERVILLE AND ROBERT NUCKOLS
RECLAMATION PROJECT
TULARE COUNTY

Robert Nuckols (hereafter User) reclaims secondary disinfected wastewater from the City of Porterville Wastewater Treatment Facility (WWTF) on 932 acres of cropland (hereafter use area). The use area is about 2.5 miles southwest of the WWTF. Of the 932 acres of use area, 573 acres (hereafter designated use area) are owned or leased by the User and the remaining 359 acres are owned by the City of Porterville. The Requirements regarding reclamation on the 359-acre City land are contained in Waste Discharge Requirements Order No. 5-01-103, adopted for the City of Porterville WWTF. Over the years, the User has been using only 300 to 500 acres of the 932 acres of land available for wastewater reclamation. The WWTF has the capacity to treat 8.0 million gallons per day (mgd) of wastewater. Current WWTF flow averages 4.35 mgd. The User generally reclaims 25% of this wastewater. The remaining wastewater is disposed of by percolation at a disposal field close to the use area. The concrete-lined Friant-Kern Canal borders the designated use area to the west. The Tule River is about one mile north and Deer Creek is about two and one-half miles south of the designated use area.

The designated use area is in portions of Sections 5, 6, 7, and 8 of T22S, R27E, MDB&M, as shown in Attachment A, which is attached hereto and part of this Order by reference. The Assessor Parcel Numbers of the use area are 302-110-70, 302-110-08, 302-110-09, 302-11-10, 302-110-72, 302-110-73, 302-110-59, 302-110-32, 302-110-01, 302-080-17, 302-080-65, 302-080-66, 302-080-67, 302-080-68, 302-08070, 302-090-05, 302-130-28, 302-060-13, 302-100-03, 302-130-27, 302-060-12.

The California Department of Health Services (DHS) has established statewide criteria in Title 22, California Code of Regulations, section 60301 et seq., for the use of recycled water and has developed guidelines for specific uses. Title 22, was developed in consultation with representatives from wastewater treatment and recycling agencies, local health departments, and affected state agencies.

The User grows fodder and fiber crops at the use area. The crops are furrow and flood irrigated.

The WWTF produces about 450 tons of sludge per year. This is applied on portions of the designated use area. The nitrogen loading of the designated use area from wastewater is 340 to 570 lbs/acre/year. The nitrogen loading from sludge application is 20 to 40 lbs/acre/year. The User also applies commercial fertilizers on the designated use area at a rate of 60 to 120 lbs/acre/year. The combined nitrogen loading on the use area may be excessive as fodder and fiber crop utilize only 100 to 480 lbs/acre/year of nitrogen.

In 1993, the City of Porterville submitted to the Board a report on hydraulic and nutrient management at the designated use area. As per the report, the Discharger's application of wastewater and nitrogen through wastewater, sludge, and commercial fertilizer are less than the crop water and nutrient requirement. A revised report needs to be submitted to reflect actual acreage of land used for reclamation. This Order requires the User to submit an irrigation management plan.

The City of Porterville has established a groundwater monitoring system at the designated use area. The groundwater monitoring system consists of one upgradient well (MW101) and three downgradient wells (MW102, MW103, MW104). These wells have been monitored since 1993. The downgradient wells show EC, TDS, nitrate-nitrogen, chloride, sulfate, and calcium concentrations higher than the upgradient well. Analyzing the extent of the groundwater impact and conducting any remedial action is covered separately and not in this Order.

Surface water drainage from this facility is to the Tule River. The beneficial uses of the Tule River below Lake Success are municipal, industrial and agricultural supply, water contact and noncontact water recreation, warm freshwater habitat, wildlife habitat, and groundwater recharge.

Soils at the site are medium to fine textured with hardpan and restricted subsoil drainage. Soil permeabilities are low.

The groundwater monitoring shows that the depth of groundwater at the WWTF varies between 40 to 80 feet below ground surface. The beneficial uses of groundwater in the area are municipal, industrial, and agricultural supply.

Average annual rainfall and pan evaporation rate in the area are 11 and 78 inches, respectively. Water in the Tulare Lake Basin is in short supply, requiring importation of surface waters from other parts of the State. The Basin Plan encourages reclamation on irrigated crops wherever feasible.

The action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA) in accordance with Title 14, California Code of Regulations (CCR), section 15301.

The permitted discharge is consistent with the antidegradation provisions of State Water Resources Control Board Resolution No. 68-16. The proposed Order requires that effluent, WWTF sludge, and chemical fertilizers be applied at rates not exceeding crop agronomic rates. The proposed Order further contains conditions typical of those imposed on agricultural reclamation activities, including setback distances for the use of reclaimed water.

BLH:jlk:10/19/01

6. Map of Reclamation Area

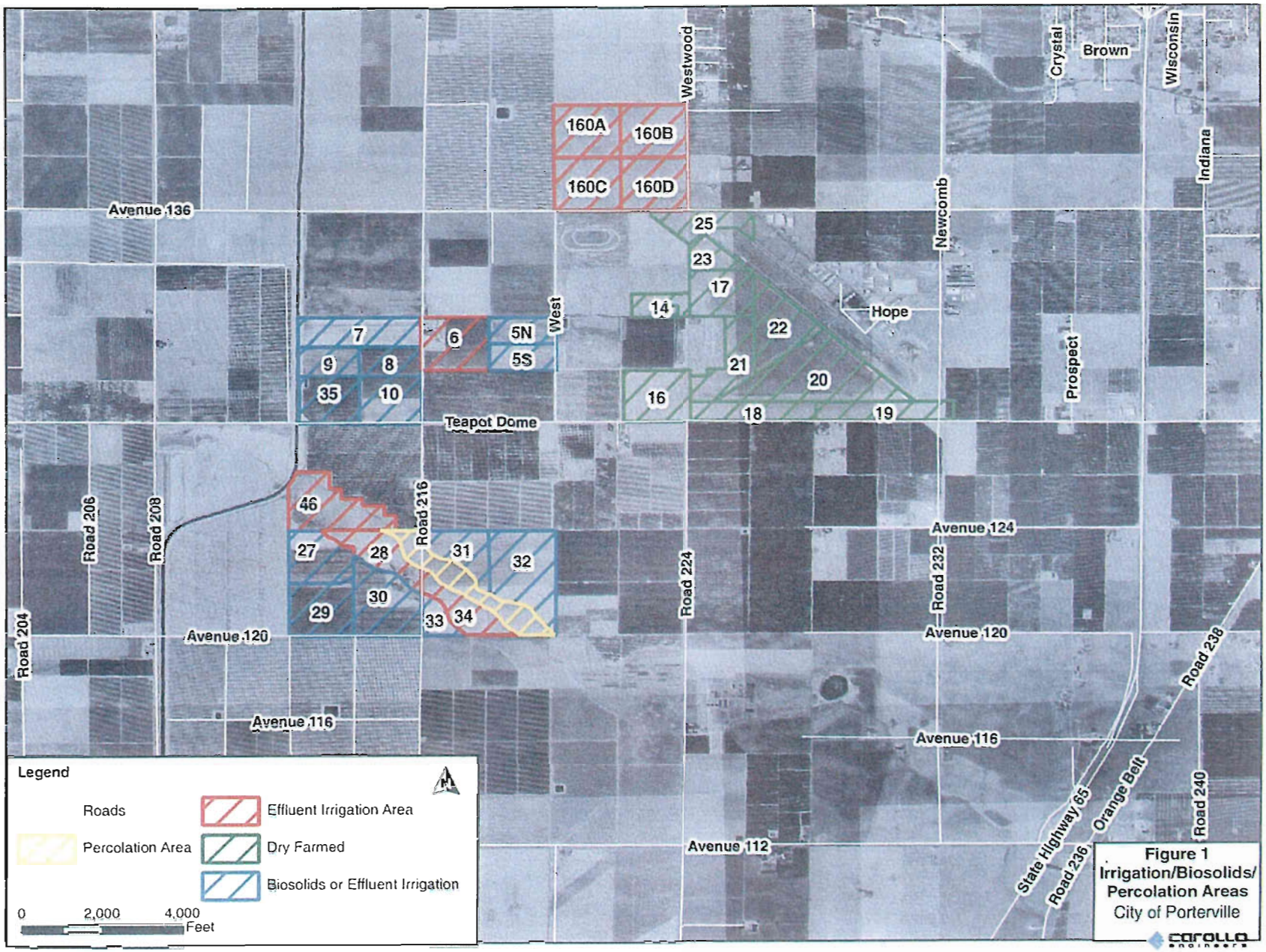


Figure 1
Irrigation/Biosolids/ Percolation Areas
City of Porterville

carollo engineers

7. Soil Analysis

Valley Tech
AGRICULTURAL LABORATORY SERVICES

2120 South 'K' Street
Tulare, California 93274
Office: 559 - 688-5684
Fax: 559 - 688-5768

SOIL ANALYSIS

Client: CITY of PORTERVILLE
291 No. MAIN STREET
PORTERVILLE, CALIFORNIA 93257

Material: SOIL

RANCH: BOB C. NUCKOLS

Lab No.: 08-19S403
Submitted Date: 08-19-09
Report Date: 08-28-09
Submitted By: ROBERT ALVAREZ

DESCRIPTION	% SP	pH	EC dS/m	meq/L Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
1. Fld # 8	26	5.2	1.94	11.4	6.4	1.3	0.3	0.8	<1.0	0.09	-	0.4	48.8	35.1	149	3.9	57.5	50.5	2.7	29
2. Fld #16	24	5.2	0.82	4.1	2.5	1.4	0.2	1.1	<1.0	0.03	-	0.3	22.0	50.3	90	5.4	64.8	44.4	2.9	24
3. Fld #17	32	6.4	1.09	6.6	2.7	1.1	0.5	1.1	<1.0	0.08	-	0.7	15.0	47.1	230	8.0	38.2	37.9	2.0	24
4. Fld #19 No.	25	5.0	1.59	8.3	5.8	1.5	0.3	0.7	<1.0	0.06	-	0.3	37.6	36.7	149	3.1	100.3	56.8	2.8	41
5. Fld #19 So.	25	5.5	2.33	13.8	7.2	1.8	0.4	0.9	<1.0	0.06	-	0.2	20.3	33.5	118	2.4	78.0	42.5	2.0	201
6. Fld #20	29	5.0	1.82	11.0	5.4	1.5	0.3	0.5	<1.0	0.05	-	0.4	17.7	77.1	105	6.2	52.5	70.2	3.2	149
7. Fld #21	31	5.9	1.79	10.9	4.2	1.7	1.0	1.2	<1.0	0.09	-	0.7	55.8	42.1	221	7.5	58.2	40.7	2.9	24
8. Fld #22	28	6.4	1.40	9.8	3.3	0.8	0.2	0.6	<1.0	0.09	-	0.2	15.6	62.6	99	1.6	39.9	42.7	1.7	52
9. Fld #23	28	6.5	1.01	6.7	2.4	0.7	0.3	0.7	<1.0	0.08	-	0.2	33.1	43.5	192	3.5	31.3	20.4	2.3	21
10. Fld #25	26	5.8	0.70	3.8	1.9	1.2	0.2	0.5	<1.0	0.06	-	0.2	25.5	17.9	73	2.1	56.1	29.3	1.3	17
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5		>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50

DESCRIPTION	EXCHANGEABLE CATIONS (ppm - %) Ca	%	Mg	%	Na	%	K	%	H	%	C.E.C. meq/100g	% O.M.	PPM TN
1. Fld # 8	1829	68.9	383	24.1	23	1.1	149	2.9	4	3.0	13.3	1.63	814
2. Fld #16	826	63.7	194	24.9	17	1.6	90	3.5	4	6.2	6.5	1.53	656
3. Fld #17	2042	74.3	301	18.2	23	1.0	230	4.3	3	2.2	13.7	3.00	1,713
4. Fld #19 No.	1473	63.3	400	28.6	25	1.3	149	3.3	4	3.4	11.6	1.50	752
5. Fld #19 So.	1066	66.5	225	23.4	17	1.4	118	3.8	4	5.0	8.0	1.48	733
6. Fld #20	1165	69.7	201	20.0	31	2.3	105	3.2	4	4.8	8.4	2.23	1,233
7. Fld #21	1442	71.1	217	17.9	24	1.5	221	5.6	4	3.9	10.1	2.40	1,465
8. Fld #22	2049	80.1	227	14.8	17	0.8	99	2.0	3	2.3	12.8	1.75	709
9. Fld #23	2079	76.3	291	17.8	16	0.8	192	3.6	2	1.5	13.6	1.86	927
10. Fld #25	974	68.1	191	22.3	17	1.5	73	2.6	4	5.6	7.2	1.30	576
DESIRED RANGES		>75%	100	10-20%	<150	<5.0%		>4.0%				1.0%	1,000

RED = LOW BLUE = HIGH DOMINANT SOLUBLE SALT IS UNDERLINED. SEE ENCLOSED INTERPRETATION GUIDES.

IF YOU SHOULD HAVE ANY QUESTIONS, PLEASE CALL. THANK YOU.

Joe O'Brien - Soil Technologist

Valley Tech
AGRICULTURAL LABORATORY SERVICES

2120 South 'K' Street
Tulare, California 93274
Office: 559 - 688-5684
Fax: 559 - 688-5768

SOIL ANALYSIS

Client: PERIGO FARMING
10835 ROAD 176
TERRA BELLA, CALIFORNIA 93270

Material: SOIL - 0 to 12"
RANCH: CITY of PORTERVILLE - 2011

Lab No.: 03-31S433
Submitted Date: 03-31-11
Report Date: 04-06-11
Submitted By: KIM PERIGO

DESCRIPTION	% SP	pH	EC dS/m	meq/L Soil Solution Constituents Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
1. 10	28	6.9	0.65	2.2	0.7	3.8	0.1	0.8	3.3	0.22	+	0.3	2.2	50.0	137	5.8	15.2	24.3	3.0	28
2. 9	27	7.0	0.78	2.3	0.7	4.7	0.1	0.8	4.2	0.16	-	0.4	3.0	42.4	92	4.1	15.6	23.3	2.2	27
3. 8	28	6.8	0.63	2.3	0.8	3.3	0.1	1.2	2.6	0.15	-	0.3	4.3	34.4	128	7.0	20.8	19.8	3.3	24
4. 7	26	7.3	0.65	1.6	0.5	4.4	0.1	2.3	5.0	0.16	-	0.3	3.3	8.6	102	1.4	14.5	23.6	1.2	21
5. 5-S	27	7.0	0.98	4.0	1.2	4.6	0.1	0.9	2.9	0.12	-	0.3	12.6	25.0	81	2.5	14.7	21.8	1.6	37
6. 5-N	26	7.1	0.96	3.7	1.1	4.7	0.1	0.7	3.1	0.15	-	0.3	6.7	50.9	93	5.1	14.8	24.6	2.9	31
7. 160 D	21	7.3	0.68	1.7	0.5	4.6	0.1	1.4	4.9	0.15	-	0.3	1.7	4.3	73	0.5	10.4	14.2	0.8	23
8. 160 C	22	7.2	0.78	2.3	0.5	5.4	0.1	1.4	5.2	0.22	+	0.3	1.7	4.6	82	0.5	12.6	14.4	0.7	24
9. 160 B	29	7.4	0.62	2.7	0.7	3.1	0.1	0.7	2.2	0.30	+	0.2	1.3	8.2	144	0.3	7.2	9.6	0.5	18
10. 160 A	23	6.9	0.56	1.6	0.5	3.6	0.1	1.9	3.7	0.16	-	0.2	1.4	3.9	98	0.3	13.5	12.3	0.8	22
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5		>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	%	Mg	%	Na	%	K	%	H	%	C.E.C. meq/100g	% O.M.	PPM TN
1. 10	2300	72.8	342	18.1	143	5.7	137	2.2	2	1.3	15.8	1.06	436
2. 9	2100	75.0	268	15.9	151	6.7	92	1.7	1	0.7	14.0	1.30	584
3. 8	2058	72.3	323	18.9	117	5.1	128	2.3	2	1.4	14.2	1.28	574
4. 7	2365	75.7	275	14.7	181	7.3	102	1.7	1	0.6	15.6	1.06	311
5. 5-S	1932	77.4	227	15.2	100	5.0	81	1.7	1	0.8	12.5	1.36	513
6. 5-N	2304	77.0	280	15.6	124	5.2	93	1.6	1	0.7	15.0	1.32	328
7. 160 D	1543	73.6	216	17.2	109	6.5	73	1.8	1	1.0	10.5	0.58	111
8. 160 C	1512	72.7	214	17.2	119	7.1	82	2.0	1	1.0	10.4	0.78	267
9. 160 B	3696	80.3	400	14.5	117	3.2	144	1.6	1	0.4	23.0	0.64	150
10. 160 A	2036	72.2	326	19.3	119	5.3	98	1.8	2	1.4	14.1	0.77	285
DESIRED RANGES		>75%	100	10-20%	<150	<5.0%		>4.0%					

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Joe O'Brien - Soil Technologist

Valley Tech
AGRICULTURAL LABORATORY SERVICES

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Office: 559 - 688-5684
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SOIL ANALYSIS

Client: PERIGO FARMING
10835 ROAD 176
TERRA BELLA, CALIFORNIA 93270

Material: SOIL - 0 to 12"
RANCH: CITY of PORTERVILLE - 2011

Lab No.: 03-31S433
Submitted Date: 03-31-11
Report Date: 04-06-11
Submitted By: KIM PERIGO

DESCRIPTION	% SP	pH	EC dS/m	meq/L ---Soil Solution Constituents--- Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
11. 29	22	6.8	0.78	2.3	0.9	4.9	0.1	0.1	4.2	0.15	-	0.2	6.9	17.1	133	0.8	13.2	14.2	1.0	44
12. 30	26	6.9	1.07	4.8	1.6	4.9	0.2	0.4	2.7	0.11	-	0.2	16.8	30.5	140	1.1	15.3	17.7	1.4	33
13. 27	25	7.5	0.66	2.6	1.0	3.6	0.1	0.7	2.7	0.23	+	0.1	4.9	4.7	169	0.4	9.1	11.5	0.8	25
14. 28-C Oats	26	6.7	0.32	0.9	0.2	2.0	0.2	4.1	2.8	0.09	-	0.3	1.9	14.5	103	1.0	6.5	43.2	0.5	15
15. 28-B Cotton	25	7.1	0.91	3.8	1.1	4.1	0.5	1.7	2.5	0.11	-	0.2	8.0	16.8	116	0.9	6.3	33.0	0.5	16
16. 28-A Alfalfa	25	6.9	0.56	1.2	0.3	3.7	0.3	0.8	4.9	0.06	-	0.3	1.3	16.3	71	1.6	0.6	55.2	0.5	20
17. 31-26ac	26	6.6	1.59	6.4	3.3	6.6	0.2	0.5	3.0	0.15	-	0.2	25.2	36.8	126	4.5	17.3	17.2	2.7	54
18. 31-25ac	31	6.7	0.55	2.1	0.5	2.8	0.4	0.8	2.3	0.06	-	0.4	4.8	34.4	123	1.3	19.8	21.8	0.7	20
19. 33	25	6.9	1.12	5.0	1.4	5.6	0.2	0.4	3.3	0.10	-	0.2	8.3	27.6	141	2.3	25.7	22.4	1.9	53
20. 32	26	6.7	0.72	3.0	1.0	3.4	0.1	0.6	2.3	0.06	-	0.2	1.7	7.1	146	0.7	16.1	13.3	1.1	26
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5		>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
11. 29	2311	-	69.9	413	-	20.8	159	-	6.0	133	-	2.1	2	-	1.2	16.5	0.69	251
12. 30	2534	-	74.1	372	-	18.1	124	-	4.5	140	-	2.1	2	-	1.2	17.1	1.00	428
13. 27	3373	-	76.9	453	-	17.2	121	-	3.4	169	-	2.0	1	-	0.5	21.9	0.64	123
14. 28-C Oats	867	-	72.1	117	-	16.2	38	-	3.9	103	-	4.4	2	-	3.3	6.0	0.57	258
15. 28-B Cotton	1278	-	77.3	137	-	13.8	54	-	4.0	116	-	3.6	1	-	1.2	8.3	0.72	367
16. 28-A Alfalfa	681	-	71.1	85	-	14.9	46	-	6.0	71	-	3.8	2	-	4.2	4.8	0.73	349
17. 31-26ac	2038	-	67.9	411	-	22.8	141	-	5.9	126	-	2.2	2	-	1.3	15.0	0.84	344
18. 31-25ac	1122	-	73.5	142	-	15.5	52	-	4.2	123	-	4.1	2	-	2.6	7.6	1.03	461
19. 33	1978	-	67.9	402	-	23.0	124	-	5.3	141	-	2.5	2	-	1.4	14.6	0.79	298
20. 32	2238	-	73.7	339	-	18.6	96	-	3.9	146	-	2.5	2	-	1.3	15.2	0.77	321
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%						

RED = LOW BLUE = HIGH DOMINANT SOLUBLE SALT IS UNDERLINED. SEE ENCLOSED INTERPRETATION GUIDES.

IF YOU SHOULD HAVE ANY QUESTIONS, PLEASE CALL. THANK YOU.

Joe O'Brien - Soil Technologist

Valley Tech
AGRICULTURAL LABORATORY SERVICES

Mission #46 & #35

SOIL ANALYSIS

2120 South 'K' Street
Tulare, California 93274
Office: 559 - 688-5684
Fax: 559 - 688-5768

Client: PERIGO FARMING
10835 ROAD 176
TERRA BELLA, CALIFORNIA 93270

Lab No.: 03-31S433 Page 3 of 3
Submitted Date: 03-31-11
Report Date: 04-06-11
Submitted By: KIM PERIGO

Material: SOIL - 0 to 12"

RANCH: CITY of PORTERVILLE - 2011

SUGGESTED TREATMENTS	----lbs/acre---- P_2O_5	K_2O	Zn	B	S	T/ac GYP	COMMENTS
1. 10 oats	0	150	0	ok	LOW	1.5	Slightly Acidic pH. Trace free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
2. 9 oats	0	150	0	ok	LOW	1.0	Neutral pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
3. 8 oats	0	150	0	ok	LOW	1.5	Slightly Acidic pH. No free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
4. 7 oats	100	150	10	ok	LOW	1.5	Alkaline pH. No free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
5. 5-S	0	150	0	ok	LOW	1.0	Neutral pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
6. 5-N	0	150	0	ok	LOW	1.0	Slightly Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
7. 160 D	150	150	20	ok	LOW	1.5	Alkaline pH. No free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
8. 160 C oats	150	150	20	ok	LOW	1.5	Alkaline pH. Trace free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
9. 160 B	100	100	20	ok	LOW	1.5	Alkaline pH. Trace free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
10. 160 A	150	150	20	ok	LOW	1.5	Slightly Acidic pH. No free lime. Low salts (EC). Gypsum will supply Ca & Sulfate.
11. 29	50	100	15	ok	LOW	1.5	Slightly Acidic pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
12. 30	0	100	10	ok	LOW	1.0	Slightly Acidic pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
13. 27	150	100	20	LOW	LOW	1.0	Alkaline pH. Trace free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
14. 28-C Oats	75	100	15	ok	LOW	1.0	Slightly Acidic pH. No free lime. Low salts (EC). Gypsum will supply Ca & Sulfate.
15. 28-B Cotton	50	100	15	ok	LOW	1.0	Slightly Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
16. 28-A Alfalfa	50	100	5	ok	LOW	1.0	Slightly Acidic pH. No free ime. Low salts (EC). Gypsum will supply Ca & Sulfate.
17. 31-26ac	0	100	0	ok	ok	1.5	Slightly Acidic pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
18. 31-25ac	0	100	10	ok	LOW	1.0	Slightly Acidic pH. No free lime. Low salts (EC). Gypsum will supply Ca & Sulfate.
19. 33	0	100	0	ok	ok	1.0	Slightly Acidic pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
20. 32	100	100	15	ok	LOW	1.0	Slightly Acidic pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.

All samples have acceptable soil pH values within ideal ranges. The presence of free lime will provide buffering to acidic pH reactions.
Maintain soluble salts (EC) above 0.6 dS/m to sustain water penetration.
Maintain soluble Calcium (Ca) greater than TWICE the sum of soluble Magnesium (Mg) + Sodium (Na). Sodium is the dominant soluble salt.
Excessive Sodium will restrict infiltration and permeability. Soluble Ca is required to off-set adverse affects from Sodium.
Gypsum treatments will supply an immediate source of soluble Calcium & also provide Sulfate-S nutrient needs.
WHEAT SILAGE: 14 T/ac. 420 lbs N; 168 lbs P2O5; 490 lbs K2O/ac COTTON: 3 Bale yield will remove 160 lbs N; 63 lbs P2O5; 126 lbs K2O/ac.
ALFALFA: 10 T/ac annual yield removes 120 lbs P2O5 and 600 lbs K2O/ac. CORN SILAGE: 32 T/ac. 266 lbs N; 114 lbs P2O5; 266 lbs K2O/ac.
Zn rates are listed as lbs actual Zn/ac from ZnSO4. Zn is not considered an economically essential nutrient for Alfalfa. Maintain Zn for row crop rotations.
Multiply ppm NO3-N (Nitrate-N) by 4 to convert to lbs N/ac-ft of soil. Nitrate is available for plant uptake and also can be easily leached from the soil.

IF YOU SHOULD HAVE ANY QUESTIONS, PLEASE CALL. THANK YOU.

Valley Tech
AGRICULTURAL LABORATORY SERVICES

2120 South 'K' Street
Tulare, California 93274
Office: 559 - 688-5684
Fax: 559 - 688-5768

SOIL ANALYSIS

Client: PERIGO FARMING
10835 ROAD 176
TERRA BELLA, CALIFORNIA 93270

Material: SOIL - 0 - 12"

Lab No.: 04-13S182
Submitted Date: 04-13-11
Report Date: 04-19-11
Submitted By: KIM PERIGO

RANCH: CITY of PORTERVILLE - 2011

DESCRIPTION	% SP	pH	EC dS/m	meq/L ---Soil Solution Constituents--- Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
1. Field 35	29	7.4	0.95	3.6	1.2	4.7	0.2		3.1	0.08	-	0.4	7.7	45.0	145	9.6	15.5	29.3	2.3	26
2. Field 46 A Cot	30	6.4	1.15	5.4	1.6	3.9	0.6		1.8	0.05	-	0.3	30.8	23.2	108	3.8	0.9	52.2	1.0	14
3. Field 46 B Cot	29	6.7	1.26	5.9	1.8	5.1	0.5		2.5	0.09	-	0.3	27.1	22.4	120	6.1	2.4	50.7	1.9	16
4. Field 46 C Oats	30	6.3	1.09	5.2	1.4	4.0	0.4		2.0	0.04	-	0.4	34.8	21.1	78	2.8	0.6	44.6	0.7	7
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5		>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
1. Field 35	2002	-	73.7	287	-	17.6	112	-	5.2	145	-	2.7	1	-	0.7	13.6	1.70	756
2. Field 46 A Cot	843	-	71.0	107	-	15.0	41	-	4.3	108	-	4.7	3	-	5.1	5.9	1.05	490
3. Field 46 B Cot	1231	-	74.0	150	-	15.1	65	-	4.9	120	-	3.7	2	-	2.4	8.3	1.30	721
4. Field 46 C Oats	715	-	70.7	88	-	14.4	41	-	5.0	78	-	3.9	3	-	5.9	5.1	0.72	243
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%					>1.0%	

RED = LOW BLUE = HIGH DOMINANT SOLUBLE SALT IS UNDERLINED. SEE ENCLOSED INTERPRETATION GUIDES.

SUGGESTED TREATMENTS	lbs/acre P_2O_5	K_2O	Zn	B	S	T/ac GYP	COMMENTS
1. Field 35	0	100	0	ok	LOW	1.5	Alkaline pH. No free lime. Moderate salts (EC). Apply Gypsum to supply Ca & S.
2. Field 46 A Cot	0	100	0	ok	LOW	1.0	Acceptable Acidic pH. No free lime. Moderate salts. Apply Gypsum to supply Ca & S. High N.
3. Field 46 B Cot	0	100	0	ok	LOW	1.0	Slightly Acidic pH. No free lime. Moderate salts (EC). Apply Gypsum to supply Ca & S.
4. Field 46 C Oats	0	100	0	ok	LOW	1.0	Acceptable Acidic pH. No free lime. Moderate salts (EC). Apply Gypsum to supply Ca & S.

All samples have acceptable soil pH values within ideal ranges. The presence of free lime will provide buffering to acidic pH reactions.
Maintain soluble salts (EC) above 0.6 dS/m to sustain water penetration. Total salt concentrations above 4.0m dS/m are consider excessive.
Maintain soluble Calcium (Ca) greater than TWICE the sum of soluble Magnesium (Mg) + Sodium (Na). Sodium is the dominant soluble salt.
Excessive Sodium will restrict infiltration and permeability. Soluble Ca is required to off-set adverse affects from Sodium.
Gypsum treatments will supply an immediate source of soluble Calcium & also provide Sulfate-S nutrient needs. Soluble Ca will enhance K availability.
WHEAT SILAGE: 14 T/ac. 420 lbs N; 168 lbs P2O5; 490 lbs K2O/ac COTTON: 3 Bale yield will remove 160 lbs N; 63 lbs P2O5; 126 lbs K2O/ac.
ALFALFA: 10 T/ac annual yield removes 120 lbs P2O5 and 600 lbs K2O/ac. CORN SILAGE: 32 T/ac. 266 lbs N; 114 lbs P2O5; 266 lbs K2O/ac.
Zn rates are listed as lbs actual Zn/ac from ZnSO4. Zn is not considered an economically essential nutrient for Alfalfa. Maintain Zn for row crop rotations.
Multiply ppm NO3-N (Nitrate-N) by 4 to convert to lbs N/ac-ft of soil. Nitrate is available for plant uptake and also can be easily leached from the soil.

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SOIL ANALYSIS

Client: PERIGO FARMING
10835 ROAD 176
TERRA BELLA, CALIFORNIA 93270

Lab No.: 11-09S184
Submitted Date: 11-09-11
Report Date: 11-17-11

Material: SOIL - 0 to 12" - ALFALFA/COTTON - ESTABLISHED
Submitted By: KIM PERIGO

RANCH: CITY OF PORTERVILLE - FALL 2011 - CORRECTED VERSION

DESCRIPTION	% SP	pH	EC dS/m	meq/L Ca	meq/L Mg	meq/L Na	meq/L K	meq/L Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	PPM NO_3N	PPM PO_4P	PPM K AA	PPM Zn	PPM Mn	PPM Fe	PPM Cu	PPM SO_4S
				---Soil Solution Constituents---																
1. 10	30	7.0	0.63	2.0	0.5	3.9	0.1	2.0	3.8	0.06	-	0.2	6.5	43.3	108	7.6	13.7	26.1	2.8	25
2. 9	33	7.1	0.86	2.4	0.7	5.5	0.1	3.4	5.0	0.07	-	0.3	3.9	46.9	98	5.7	12.0	18.6	2.3	46
3. 8	27	7.0	1.07	3.2	0.9	6.7	0.1	4.7	5.4	0.08	-	0.3	3.6	7.8	75	5.7	13.0	14.7	2.0	63
4. 7	34	7.4	0.99	2.6	0.6	6.5	0.1	3.9	6.0	0.07	-	0.3	2.4	5.7	77	2.3	13.7	18.7	1.3	62
5. 5-S	25	7.4	0.86	2.1	0.5	6.1	0.1	3.7	6.2	0.08	-	0.3	3.1	13.0	80	1.6	10.2	20.5	1.2	37
6. 5-N	27	7.1	1.10	5.9	1.8	3.9	0.1	1.3	1.6	0.09	-	0.2	20.6	31.9	86	5.0	9.1	18.1	2.6	26
7. 160 D	26	7.5	1.67	2.5	0.8	13.3	0.1	10.9	12.2	0.06	-	0.4	2.1	14.4	88	1.4	13.2	17.1	1.3	53
8. 160 C	25	7.5	0.99	1.7	0.5	7.8	0.1	5.9	8.9	0.06	-	0.3	3.4	14.3	88	1.2	11.1	19.0	1.2	30
9. 160 B	29	7.2	0.56	1.3	0.3	3.9	0.1	2.0	5.0	0.05	-	0.2	4.8	7.6	111	1.3	14.0	18.4	1.2	15
10. 160 A	31	7.1	0.75	1.8	0.6	5.2	0.1	2.5	5.5	0.05	-	0.2	3.1	5.0	123	1.4	12.6	16.9	1.3	32
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5		>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
1. 10	2003	-	75.4	263	-	16.5	111	-	5.2	108	-	2.1	1	-	0.8	13.3	1.58	790
2. 9	2399	-	75.4	302	-	15.8	168	-	6.6	98	-	1.6	1	-	0.6	15.9	1.47	644
3. 8	2015	-	76.2	232	-	14.6	147	-	7.0	75	-	1.5	1	-	0.8	13.2	1.28	599
4. 7	2168	-	76.7	235	-	13.9	165	-	7.3	77	-	1.4	1	-	0.7	14.1	1.57	631
5. 5-S	2111	-	76.2	240	-	14.5	158	-	7.1	80	-	1.5	1	-	0.7	13.8	1.00	364
6. 5-N	2257	-	79.9	248	-	14.6	73	-	3.2	86	-	1.6	1	-	0.7	14.1	1.15	595
7. 160 D	1552	-	68.2	224	-	16.4	229	-	12.6	88	-	2.0	1	-	0.9	11.4	1.19	306
8. 160 C	1661	-	67.5	288	-	19.5	204	-	10.4	88	-	1.8	1	-	0.8	12.3	0.96	293
9. 160 B	2154	-	72.7	333	-	18.7	142	-	6.0	111	-	1.9	1	-	0.7	14.8	0.92	364
10. 160 A	2068	-	70.3	354	-	20.0	161	-	6.9	123	-	2.1	1	-	0.7	14.7	1.10	497
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%					>1.0%	

RED = LOW BLUE = HIGH DOMINANT SOLUBLE SALT IS UNDERLINED. SEE ENCLOSED INTERPRETATION GUIDES.

IF YOU SHOULD HAVE ANY QUESTIONS, PLEASE CALL. THANK YOU.

Joe O'Brien - Soil Technologist

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Office: 559 - 688-5684
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SOIL ANALYSIS

Client: PERIGO FARMING
10835 ROAD 176
TERRA BELLA, CALIFORNIA 93270

Lab No.: 11-09S184
Submitted Date: 11-09-11
Report Date: 11-17-11

Material: SOIL - 0 to 12" - ALFALFA/COTTON - ESTABLISHED
Submitted By: KIM PERIGO

RANCH: CITY OF PORTERVILLE - FALL 2011 - CORRECTED VERSION

DESCRIPTION	% SP	pH	EC dS/m	meq/L Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
				---Soil Solution Constituents---																
11. 29	28	7.4	0.87	2.4	0.7	5.5	0.1	3.9	5.0	0.06	-	0.2	4.7	19.1	176	1.2	11.4	14.4	1.2	26
12. 30	28	7.2	0.88	2.4	0.8	5.5	0.1	4.8	4.9	0.07	-	0.2	3.6	21.0	145	2.5	10.5	12.9	1.9	25
13. 27	27	7.4	0.69	2.0	0.7	4.3	0.1	2.5	4.1	0.07	-	0.2	2.9	3.1	132	0.4	11.1	10.0	0.9	15
14. 28-C Oats	25	6.9	0.48	1.1	0.2	3.0	0.2	1.5	3.9	0.06	-	0.2	5.4	10.8	109	0.7	6.7	34.5	0.6	12
15. 28-B Cotton	23	7.2	0.92	2.6	0.7	5.2	0.3	6.0	4.5	0.06	-	0.2	5.0	13.2	77	0.9	8.1	51.8	0.6	14
16. 28-A Alfalfa	27	7.0	0.68	2.8	0.7	3.7	0.3	1.1	2.8	0.05	-	0.2	12.7	19.7	112	2.1	2.2	46.8	0.7	8
17. 31-26ac	25	7.1	1.01	2.1	1.0	6.7	0.1	7.6	6.3	0.06	-	0.2	3.9	14.5	89	3.1	9.8	16.2	2.1	27
18. 31-25ac	32	7.1	0.48	0.9	0.2	3.3	0.1	2.0	4.9	0.06	-	0.2	5.7	19.1	103	1.5	9.4	31.8	0.9	11
19. 33	26	7.0	0.95	2.3	1.1	6.1	0.1	5.9	5.3	0.06	-	0.2	3.5	17.3	126	2.7	15.2	16.8	1.9	31
20. 32	26	6.9	0.76	1.6	0.6	5.1	0.1	4.7	5.6	0.05	-	0.2	3.2	7.1	103	0.4	15.0	15.4	1.0	26
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5		>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
11. 29	2692	-	72.3	422	-	18.9	172	-	5.8	176	-	2.4	1	-	0.5	18.6	1.45	576
12. 30	2388	-	74.4	330	-	17.1	143	-	5.6	145	-	2.3	1	-	0.6	16.1	0.98	392
13. 27	2851	-	76.1	380	-	16.9	141	-	4.7	132	-	1.8	1	-	0.5	18.7	0.77	126
14. 28-C Oats	976	-	70.4	158	-	19.0	56	-	5.0	109	-	4.0	1	-	1.4	6.9	0.88	376
15. 28-B Cotton	906	-	74.8	102	-	14.1	61	-	6.3	77	-	3.3	1	-	1.7	6.1	0.50	161
16. 28-A Alfalfa	1173	-	75.1	148	-	15.8	52	-	4.2	112	-	3.7	1	-	1.3	7.8	0.59	139
17. 31-26ac	1831	-	67.8	359	-	22.2	163	-	7.5	89	-	1.7	1	-	0.7	13.5	0.66	216
18. 31-25ac	1418	-	74.0	192	-	16.7	84	-	5.5	103	-	2.7	1	-	1.0	9.6	1.09	280
19. 33	2038	-	67.7	421	-	23.3	148	-	6.1	126	-	2.1	1	-	0.7	15.0	0.96	208
20. 32	1669	-	70.2	293	-	20.6	117	-	6.1	103	-	2.2	1	-	0.8	11.9	0.89	303
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%					>1.0%	

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SOIL ANALYSIS

Client: PERIGO FARMING
10835 ROAD 176
TERRA BELLA, CALIFORNIA 93270

Lab No.: 11-09S184
Submitted Date: 11-09-11
Report Date: 11-17-11

Material: SOIL - 0 to 12" - ALFALFA/COTTON - ESTABLISHED
Submitted By: KIM PERIGO

RANCH: CITY OF PORTERVILLE - FALL 2011 - CORRECTED VERSION

SUGGESTED TREATMENTS	----lbs/acre---- P_2O_5	K_2O	Zn	B	SO_4S	T/ac GYP	COMMENTS
1. 10	0	200	0	ok	LOW	2.0	Neutral pH. No free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
2. 9	0	200	0	ok	LOW	1.5	Slightly Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
3. 8	150	200	0	ok	ok	1.5	Neutral pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
4. 7	150	200	0	ok	ok	1.5	Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
5. 5-S	75	200	5	ok	LOW	2.0	Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
6. 5-N	0	200	0	ok	LOW	1.0	Slightly Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
7. 160 D	75	200	10	ok	ok	3.0	Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
8. 160 C	75	200	10	ok	LOW	2.0	Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
9. 160 B	150	200	10	ok	LOW	2.0	Alkaline pH. No free lime. Low salts (EC). Gypsum will supply Ca & Sulfate.
10. 160 A	150	200	10	ok	LOW	2.0	Slightly Alkaline pH. No free lime. Moderate-Marginal salts. Gypsum will supply Ca & Sulfate.
11. 29	50	150	10	ok	LOW	2.0	Neutral pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
12. 30	0	150	0	ok	LOW	1.5	Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
13. 27	150	150	15	ok	LOW	1.5	Alkaline pH. No free lime. Marginal salts (EC). Gypsum will supply Ca & Sulfate.
14. 28-C Oats	100	150	15	ok	LOW	2.0	Slightly Acidic pH. No free lime. Low salts (EC). Gypsum will supply Ca & Sulfate.
15. 28-B Cotton	100	150	15	ok	LOW	2.0	Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
16. 28-A Alfalfa	50	150	0	ok	LOW	2.0	Neutral pH. No free lime. Moderate-Marginal salts (EC). Gypsum will supply Ca & Sulfate.
17. 31-26ac	75	200	0	ok	LOW	2.0	Slightly Alkaline pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
18. 31-25ac	50	200	5	ok	LOW	2.0	Slightly Alkaline pH. No free lime. Low salts (EC). Gypsum will supply Ca & Sulfate.
19. 33	50	200	0	ok	LOW	2.0	Neutral pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.
20. 32	150	200	15	ok	LOW	2.0	Slightly Acidic pH. No free lime. Moderate salts (EC). Gypsum will supply Ca & Sulfate.

All samples have acceptable soil pH values within ideal ranges. All samples are non-calcareous, no free lime is present.
Free lime (Calcium Carbonate) is a naturally occurring deposit that is a source of insoluble Ca. Free lime will provide buffering or resistance to pH reduction.
Maintain soluble salts (EC) above 0.6 dS/m to sustain water penetration. Total salt concentrations above 4.0 dS/m are considered to be excessive.
Maintain soluble Calcium (Ca) greater than TWICE the sum of soluble Magnesium (Mg) + Sodium (Na). Sodium is the dominant soluble salt in most all areas.
Excessive Sodium will restrict infiltration and permeability. Soluble Ca is required to off-set adverse affects from Sodium.
Gypsum treatments will supply an immediate source of soluble Calcium & also provide Sulfate-S nutrient needs. Increrase soluble Ca.
Zn rates are listed as lbs actual Zn/ac from ZnSO4. Zn is not considered an economically essential nutrient for Alfalfa. Maintain Zn for row crop rotations.
Multiply ppm NO3-N (Nitrate-N) by 4 to convert to lbs N/ac-ft of soil. Nitrate is available for plant uptake and also can be easily leached from the soil.

IF YOU SHOULD HAVE ANY QUESTIONS, PLEASE CALL. THANK YOU.

Attn: Robert
From: Kim Perigo

Valley Tech
AGRICULTURAL LABORATORY SERVICES

2120 South 'K' Street
Tulare, California 93274
Office: 559 - 688-5684
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SOIL ANALYSIS

Client: RICK PERIGO ROADSIDING
10835 ROAD 176
TERRA BELLA,CALIFORNIA 93270

Material: SOIL - 0 to 18" - OATS/ALFALFA/CORN

RANCH: CITY OF PORTERVILLE

Lab No.: 09-27S1241 Page 1 of 3
Submitted Date: 09-27-13
Report Date: 10-03-13
Submitted By: RICK PERIGO

DESCRIPTION	% SP	pH	EC dS/m	meq/L Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
				--Soil Solution Constituents--																
1. Field 160 A	29	7.2	1.87	9.0	2.8	8.7	0.2	2.8	3.9	0.28	-	0.2	10.4	21.6	125	2.7	12.7	17.0	1.7	168
2. Field 160 B	32	7.5	1.50	7.0	2.2	7.2	0.2	2.1	3.6	0.61	+	0.2	10.7	16.4	154	1.2	6.6	7.8	0.8	117
3. Field 160 C	23	7.6	1.11	2.6	0.9	8.0	0.2	3.5	7.1	0.13	-	0.2	5.0	27.4	99	1.6	10.1	15.1	1.1	37
4. Field 160 D	26	7.7	4.04	14.5	4.5	26.4	0.2	10.1	10.2	0.11	-	0.3	16.4	7.5	91	0.6	9.7	9.8	0.8	373
5. Field 5 North	29	7.4	0.73	3.3	1.0	3.5	0.2	1.3	2.2	0.15	-	0.2	3.0	61.8	101	4.5	8.2	16.5	2.4	34
6. Field 5 South	31	7.5	0.72	2.9	0.9	4.3	0.1	0.9	3.2	0.11	-	0.2	3.7	24.8	90	2.7	9.6	17.3	1.5	27
7. Field 7	24	7.7	1.21	3.2	0.7	8.8	0.1	3.6	7.4	0.11	-	0.3	1.7	13.8	86	1.2	11.2	15.7	1.1	49
8. Field 8	28	7.5	1.16	3.2	0.9	8.3	0.1	4.7	6.8	0.17	-	0.2	2.5	18.0	102	5.1	10.6	13.1	2.2	42
9. Field 9	28	7.6	1.09	2.7	0.7	8.3	0.1	3.3	7.5	0.16	-	0.4	3.8	48.5	107	3.3	9.3	13.7	1.7	39
10. Field 10	29	7.3	0.80	2.4	0.8	5.5	0.1	2.2	5.0	0.11	-	0.2	3.6	46.9	134	4.2	8.9	12.6	2.2	26
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5	<20.0	>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
1. Field 160 A	2054	-	73.6	288	-	17.2	139	-	6.2	125	-	2.3	1	-	0.7	14.0	1.25	504
2. Field 160 B	3105	-	76.1	405	-	16.6	159	-	4.9	154	-	1.9	1	-	0.5	20.4	1.00	399
3. Field 160 C	1558	-	70.9	229	-	17.3	149	-	8.5	99	-	2.3	1	-	0.9	11.0	0.78	236
4. Field 160 D	1653	-	67.9	232	-	15.9	262	-	13.5	91	-	1.9	1	-	0.8	12.2	0.76	372
5. Field 5 North	2133	-	75.5	305	-	18.0	89	-	3.9	101	-	1.8	1	-	0.7	14.1	0.86	456
6. Field 5 South	2161	-	76.8	268	-	15.8	112	-	5.0	90	-	1.6	1	-	0.7	14.1	0.92	495
7. Field 7	2047	-	75.4	218	-	13.4	193	-	8.9	86	-	1.6	1	-	0.7	13.6	1.26	692
8. Field 8	2073	-	72.7	271	-	15.8	205	-	9.0	102	-	1.8	1	-	0.7	14.3	1.07	465
9. Field 9	2094	-	72.0	285	-	16.3	213	-	9.1	107	-	1.9	1	-	0.7	14.5	1.06	436
10. Field 10	2272	-	73.0	313	-	16.8	185	-	7.4	134	-	2.2	1	-	0.6	15.6	0.97	463
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%					1.0%	

RED = LOW BLUE = HIGH DOMINANT SOLUBLE SALT IS UNDERLINED. SEE ENCLOSED INTERPRETATION GUIDES.

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SOIL ANALYSIS

Client: RICK PERIGO ROADSIDING
10835 ROAD 176
TERRA BELLA,CALIFORNIA 93270

Material: SOIL - 0 to 18" - OATS/ALFALFA/CORN

RANCH: CITY OF PORTERVILLE

Lab No.: 09-27S1241 Page 2 of 3
Submitted Date: 09-27-13
Report Date: 10-03-13
Submitted By: RICK PERIGO

DESCRIPTION	% SP	pH	EC dS/m	meq/L ---Soil Solution Constituents-- Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
11. Field 27	25	7.4	0.98	2.5	0.8	7.0	0.1	3.1	6.4	0.10	-	0.1	3.1	14.2	112	3.4	7.6	13.4	2.9	27
12. Field 28 A	29	6.8	0.58	1.7	0.5	3.4	0.3	1.0	3.5	<0.10	-	0.2	11.8	21.2	79	1.9	0.5	34.8	0.5	14
13. Field 28 B	25	7.5	0.73	1.8	0.7	5.1	0.3	1.9	5.2	<0.10	-	0.1	4.2	42.0	89	2.2	3.8	22.8	1.0	18
14. Field 28 C	29	7.1	0.42	1.0	0.3	2.9	0.2	1.0	3.9	0.10	-	0.1	3.8	14.1	140	0.5	7.5	22.7	0.6	12
15. Field 29	18	7.6	1.10	2.4	0.9	8.3	0.2	3.9	7.7	0.13	-	0.2	2.8	15.6	80	0.6	6.3	8.5	0.7	36
16. Field 30	27	7.4	1.26	2.7	0.8	9.9	0.1	4.4	8.8	0.13	-	0.2	4.9	5.6	118	2.3	10.2	17.7	1.7	52
17. Field 31	22	7.6	1.19	2.1	1.0	9.5	0.1	5.3	9.1	0.11	-	0.1	2.7	11.9	115	0.6	7.4	12.8	1.0	39
18. Field 32	25	7.5	1.11	2.0	0.6	8.7	0.2	6.1	9.1	0.14	-	0.1	2.6	5.7	101	0.5	9.0	9.6	0.8	27
19. Field 33	28	7.6	1.18	2.8	1.1	8.7	0.2	3.9	7.4	0.17	-	0.1	4.4	27.3	137	1.8	9.6	12.9	1.5	46
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5	<20.0	>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
11. Field 27	1730	-	71.4	255	-	17.5	153	-	7.9	112	-	2.4	1	-	0.8	12.1	0.79	367
12. Field 28 A	768	-	71.4	99	-	15.4	49	-	5.7	79	-	3.8	2	-	3.7	5.4	0.83	280
13. Field 28 B	988	-	71.4	142	-	17.1	75	-	6.7	89	-	3.3	1	-	1.4	6.9	0.65	97
14. Field 28 C	1612	-	73.1	229	-	17.3	95	-	5.4	140	-	3.2	1	-	0.9	11.0	0.57	162
15. Field 29	1476	-	68.0	257	-	19.8	164	-	9.4	80	-	1.9	1	-	0.9	10.9	0.68	326
16. Field 30	1818	-	68.9	284	-	18.0	212	-	10.0	118	-	2.3	1	-	0.8	13.2	0.43	151
17. Field 31	1677	-	65.7	327	-	21.3	201	-	9.8	115	-	2.3	1	-	0.8	12.8	1.22	632
18. Field 32	1949	-	66.0	365	-	20.6	261	-	11.0	101	-	1.7	1	-	0.7	14.8	0.65	229
19. Field 33	1954	-	65.7	401	-	22.5	207	-	8.7	137	-	2.4	1	-	0.7	14.9	0.96	455
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%					1.0%	

RED = LOW BLUE = HIGH DOMINANT SOLUBLE SALT IS UNDERLINED SEE ENCLOSED INTERPRETATION GUIDES.

IF YOU SHOULD HAVE ANY QUESTIONS, PLEASE CALL. THANK YOU.

Joe O'Brien - Soil Technologist

Valley Tech
AGRICULTURAL LABORATORY SERVICES

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SOIL ANALYSIS

Client: RICK PERIGO ROADSIDING
10835 ROAD 176
TERRA BELLA,CALIFORNIA 93270

Material: SOIL - 0 to 18" - OATS/ALFALFA/CORN

RANCH: CITY OF PORTERVILLE

Lab No.: 09-27S1241 Page 3 of 3
Submitted Date: 09-27-13
Report Date: 10-03-13
Submitted By: RICK PERIGO

DESCRIPTION	% SP	pH	EC dS/m	meq/l --Soil Solution Constituents-- Ca	Mg	Na	K	Cl	ESP	% $CaCO_3$ QUANT	LIME PRESENCE LP	PPM B	NO_3N	PO_4P	K AA	Zn	Mn	Fe	Cu	SO_4S
20. Field 34 A	34	7.1	0.59	1.1	0.4	4.5	0.2	2.0	6.1	0.14	-	0.2	4.2	21.9	94	1.2	6.8	15.5	0.6	17
21. Field 34 B	30	7.8	0.60	1.5	0.5	4.3	0.2	1.5	4.9	0.13	-	0.1	2.1	15.4	113	0.7	4.4	16.6	0.5	13
22. Field 34 C	34	6.8	1.01	3.2	1.0	6.0	0.5	3.3	4.6	0.11	-	0.3	4.7	43.3	133	2.4	16.2	29.5	1.1	24
23. Field 34 D	31	7.2	1.00	3.2	0.9	6.3	0.6	3.0	5.0	0.10	-	0.3	4.1	23.7	142	1.6	12.5	16.5	0.6	26
24. Field 35	28	7.5	1.03	2.7	0.9	7.3	0.3	2.6	6.3	0.16	-	0.3	6.0	33.1	211	5.9	6.9	9.3	1.6	27
25. Field 46 East	29	7.2	0.36	0.9	0.3	2.4	0.2	0.8	3.3	<0.10	-	0.1	1.8	23.6	117	2.6	1.4	40.8	0.9	12
26. Field 46 West	24	6.9	0.45	1.2	0.4	3.0	0.2	0.9	3.5	<0.10	-	0.2	4.1	14.3	68	1.3	2.6	32.1	0.5	12
OPTIMUM RANGES		6.0-7.5	<4.00 >0.60	Ca > 2x (Mg+Na)			>0.4	<10	<5	<1.5%		>0.2 <1.5	<20.0	>16.0 >25.0 pre-plant Alfalfa	>150	>2.0	>5.0	>8.0	>1.0	>50 <400

DESCRIPTION	AMMONIUM ACETATE EXTRACTED CATIONS (ppm - %) Ca	-	%	Mg	-	%	Na	-	%	K	-	%	H	-	%	C.E.C. meq/100g	% O.M.	PPM TN
20. Field 34 A	1219	-	70.6	175	-	16.9	117	-	8.5	94	-	2.8	1	-	1.2	8.6	0.98	405
21. Field 34 B	1479	-	74.5	184	-	15.5	98	-	6.2	113	-	2.9	1	-	1.0	9.9	0.73	157
22. Field 34 C	1190	-	71.2	156	-	15.6	90	-	6.7	133	-	4.1	2	-	2.4	8.4	1.61	710
23. Field 34 D	1151	-	72.9	135	-	14.2	88	-	7.0	142	-	4.6	1	-	1.3	7.9	1.16	532
24. Field 35	2088	-	68.7	352	-	19.3	189	-	7.8	211	-	3.6	1	-	0.7	15.2	1.04	610
25. Field 46 East	996	-	73.0	133	-	16.2	54	-	4.9	117	-	4.4	1	-	1.5	6.8	0.71	338
26. Field 46 West	681	-	70.2	97	-	16.7	42	-	5.4	68	-	3.6	2	-	4.1	4.9	0.69	306
DESIRED RANGES			>75%	100		10-20%	<150		<5.0%			>4.0%					1.0%	

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Joe O'Brien - Soil Technologist

8. Soil Amendment Additions

Soil Amendments Added to Each Parcel

Month of Application	1 St. of growing year	Parcel #	Amendments Added	Quantity	Units	Date Code	Use for 503 Ca
1/1/2009	1/1/2009	27	Soil Sludge	26	Tons/Acre	SS 2008	☑
1/1/2009	1/1/2009	30	Soil Sludge	53	Ton/Acre	SS 2008	☑
1/1/2009	1/1/2009	31	Soil Sludge	53	Ton/Acre	SS 2008	☑
1/1/2009	1/1/2009	32	Soil Sludge	37	Ton/Acre	SS 2008	☑
1/1/2009	1/1/2009	33	Soil Sludge	53	Ton/Acre	SS 2008	☑
11/1/2009	1/1/2010	20	Nitrogen as Biosolids	3	Ton/Acre	BS-11-2009	☑
11/1/2009	1/1/2010	22	Nitrogen as Biosolids	3	Tons/acre	BS-11-2009	☑
11/1/2009	1/1/2010	29	Nitrogen as Biosolids	9	Ton/Acre	BS-11-2009	☑
11/1/2009	1/1/2010	32	Nitrogen as Biosolids	2.68	Ton/Acre	BS-2009-S	☑
11/1/2007	1/1/2008	5N	Nitrogen as Biosolids	20	Ton/Acre	BS-11-2007	☑
11/1/2007	1/1/2008	9	Nitrogen as Biosolids	15	Ton/Acre	BS-11-2007	☑
11/1/2007	1/1/2008	10	Nitrogen as Biosolids	19	Ton/Acre	BS-11-2007	☑
11/1/2010	1/1/2011	5S	Nitrogen as Biosolids	10	Ton/Acre	BS-11-2010	☑
11/1/2010	1/1/2011	8	Nitrogen as Biosolids	4.44	Ton/Acre	BS-11-2010	☑
11/1/2010	1/1/2011	30	Nitrogen as Biosolids	9.53	Ton/Acre	BS-11-2010	☑
11/1/2010	1/1/2011	31	Nitrogen as Biosolids	8.7	Ton/Acre	BS-11-2010	☑
11/1/2010	1/1/2011	33	Nitrogen as Biosolids	12.5	Ton/Acre	BS-11-2010	☑
11/1/2010	1/1/2011	34	Nitrogen as Biosolids	8.1	Ton/Acre	BS-11-2010	☑
11/1/2010	1/1/2011	35	Nitrogen as Biosolids	11.29	Ton/Acre	BS-11-2010	☑
2/1/2011	2/1/2011	160a	Nitrogen As Fertilizer	14	Lb/Acre	NF-2-2011	☐
2/1/2011	2/1/2011	160b	Nitrogen As Fertilizer	14	Lb/Acre	NF-2-2011	☐
2/1/2011	2/1/2011	160d	Nitrogen As Fertilizer	14	Lb/Acre	NF-2-2011	☐
2/1/2011	2/1/2011	27	Nitrogen As Fertilizer	14	Lb/Acre	NF-2-2011	☐
2/1/2011	2/1/2011	29	Nitrogen As Fertilizer	14	Lb/Acre	NF-2-2011	☐
2/1/2011	2/1/2011	32	Nitrogen As Fertilizer	14	Lb/Acre	NF-2-2011	☐
5/1/2011	5/1/2011	7	Gypsum	1.18	Ton/Acre	Gyp 5-2011	☐
5/1/2011	5/1/2011	8	Gypsum	1.18	Ton/Acre	Gyp 5-2011	☐
5/1/2011	5/1/2011	9	Gypsum	1.18	Ton/Acre	Gyp 5-2011	☐
5/1/2011	5/1/2011	10	Gypsum	1.18	Ton/Acre	Gyp 5-2011	☐
12/1/2011	12/1/2011	160a	Gypsum	1.5	ton/acre	Gyp 12-2011	☐
12/1/2011	12/1/2011	160b	Gypsum	1.5	ton/acre	Gyp 12-2011	☐
12/1/2011	12/1/2011	160d	Gypsum	1.5	ton/acre	Gyp 12-2011	☐
12/1/2011	1/1/2012	160a	Nitrogen as Biosolids	7.8	Ton/acre	BS-11-2011	☑
12/1/2011	1/1/2012	160b	Nitrogen as Biosolids	7.8	Ton/acre	BS-11-2011	☑
12/1/2011	1/1/2012	160c	Nitrogen as Biosolids	8.3	Ton/acre	BS-11-2011	☑
12/1/2011	1/1/2012	5n	Nitrogen as Biosolids	24	Ton/acre	BS-11-2011	☑
11/1/2011	1/1/2013	7	Nitrogen As Fertilizer	10	Ton/acre	BS-11-2012	☑
11/1/2012	1/1/2013	9	Nitrogen as Biosolids	10	Ton/acre	BS-11-2012	☑
11/1/2012	1/1/2013	10	Nitrogen as Biosolids	10	Ton/acre	BS-11-2012	☑

11/1/2012	1/1/2013	28b	Nitrogen as Biosolids	11	Ton/acre	BS-11-2012	☑
4/1/2013	1/1/2013	160A	Nitrogen As Fertilizer	21.1	Lb/acre	BS-11-2013	☑
4/1/2013	1/1/2013	160B	Nitrogen As Fertilizer	21.1	Lb/acre	BS-11-2013	☑
4/1/2013	1/1/2013	160D	Nitrogen As Fertilizer	21.1	Lb/acre	BS-11-2013	☑
9/1/2013	9/1/2013	160A	Gypsum	1.5	tons/acre	9/1/13	☐
9/1/2001	9/1/2013	160B	Gypsum	1.5	tons/acre	9/1/13	☐
9/1/2013	9/1/2013	160D	Gypsum	1.5	tons/acre	9/1/13	☐
10/1/2013	10/1/2013	160D	Gypsum	1.5	tons/acre	10/1/2013	☐
2/1/2013	2/1/2013	160A	Gypsum	1.5	tons/acre	2/1/13	☐
2/1/2013	2/1/2013	160B	Gypsum	1.5	tons/acre	2/1/13	☐
2/1/2013	2/1/2013	160D	Gypsum	1.5	tons/acre	2/1/13	☐
12/1/2013	12/1/2013	160A	Nitrogen As Fertilizer	13.29	Lb/acre	2/1/13	☑
11/1/2013	1/1/2014	8	Nitrogen as Biosolids	13	tons/acre	1/1/14	☑
11/1/2013	1/1/2014	160D	Nitrogen as Biosolids	13	tons/acre	1/1/14	☑
11/1/2013	1/1/2014	160B	Nitrogen as Biosolids	12	tons/acre	1/1/14	☑