STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL COAST REGION

STAFF REPORT FOR REGULAR MEETING OF MAY 28, 2015
Prepared on Monday April 20, 2015

ITEM NUMBER: 9

SUBJECT: **Issuance of Waste Discharge Requirements for Windset Farms (California), Inc., Santa Maria Greenhouses, Santa Barbara County; Order No. R3-2015-0007**

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KEY INFORMATION

Location:	1650 Black Road, Santa Maria, Santa Barbara County
Type of Discharge:	Sanitary, agricultural, industrial, and storm water
Design Capacity:	Sanitary wastewater: 8,000 gpd Agricultural and industrial wastewater: up to 750,000 gpd
Current Capacity:	Current discharge volume varies based on weather and crop demands
Treatment:	Septic tank and leach pits for sanitary wastewater. Screening detention for stormwater. Denitrification (wood chip bioreactor) for agricultural wastewater. Denitrification of shallow groundwater to remove nitrate that did not originate from the Discharger.
Disposal:	Sanitary wastewater is disposed of via leachfields
Reclamation:	Agricultural drainage is re-circulated internally and both agricultural and industrial wastewater is ultimately used for fodder crop irrigation
Existing Orders:	97-10-DWQ

This Action: **Adopt Order No. R3-**2015**-**0007

SUMMARY

Irrigated agriculture poses the greatest salt and nutrient threat to the Santa Maria Valley's water quality. The Central Coast Regional Water Quality Control Board (Central Coast Water Board) has made efforts to better regulate discharges from irrigated agriculture. In regulating irrigated agriculture, the Central Coast Water Board emphasizes best management practice (BMP) implementation to protect aquatic habitats and to reduce fertilizer, pesticide, salt, nutrient, and sediment discharges. Windset Farms is an individual farm that implements irrigated agricultural BMPs to a high degree, such as:

- Enclosing growing areas within a climate-controlled, pressurized building (roof, walls, and floor/liner)
  - ~ Rain does not drive pollutants to surface water or groundwater
  - ~ Growing requires no soil disturbances that can result in erosion and sedimentation
  - ~ The greenhouse provides barriers to pests, which reduces the need for pesticides
  - ~ Evapotranspired water and wall condensate are captured and reused
  - ~ Producing remarkable crop yields while minimizing land use "footprint" and environmental impacts

- Collecting and re-using agricultural drainage/tailwater and wall condensate
  - ~ Highly efficient use of water, pesticides, and nutrients
  - ~ No fugitive water, pesticides, and nutrients

- Treating wastewater for nitrate, then recycling treated wastewater for agronomic fodder crop irrigation

The proposed WDRs regulate Windset Farms' discharge while acknowledging and accounting for Windset Farms' implementation of industry-leading BMPs. The proposed WDRs were therefore developed from a context that considered greater Central Coast Water Board priorities and cross-program needs, rather than the conventional context of isolated point-source considerations.

Of particular note, the proposed WDRs allow Windset Farms to:

- Remediate shallow groundwater nitrate that did not originate from Windset Farms' discharge, and

- Contribute, in lieu of on-site groundwater monitoring, financial resources towards filling in data gaps in
  - ~ a basin-wide salt/nutrients management plan effort, and
  - ~ the Central Coast Water Board's Santa Maria River salt TMDL.

The above special proposals align with Central Coast Water Board priorities and will mutually benefit Windset Farms and the Water Board (this will be explained in greater detail later in this staff report).

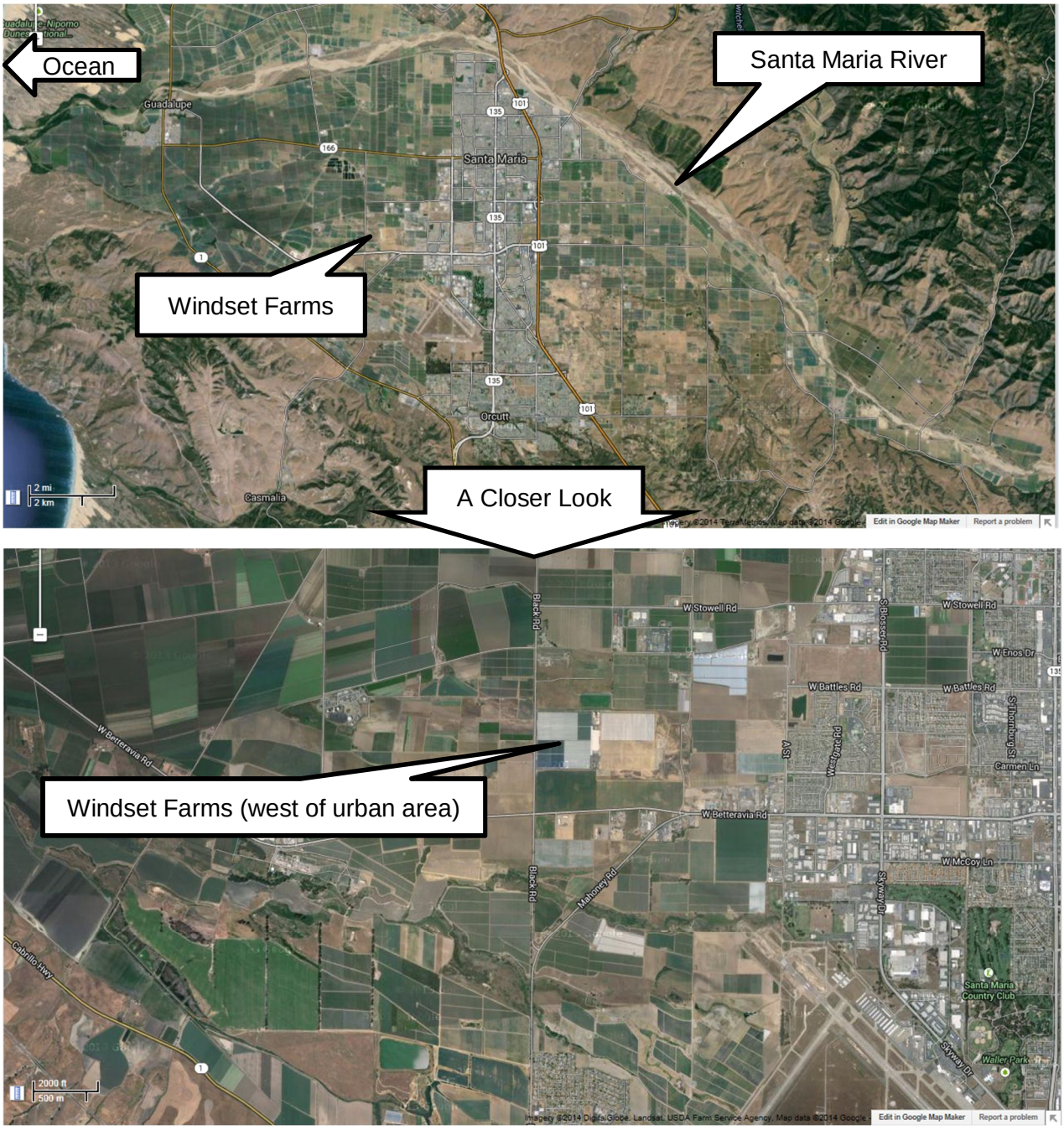
Staff recommends adoption of the proposed WDRs to regulate Windset Farms in a way that advances the Central Coast Water Board's greater cause of irrigated lands BMP implementation, groundwater nitrate remediation, and TMDL development.

DISCUSSION

Background

Windset Farms owns and operates a relatively new, modern hydroponic greenhouse and packing business in Santa Maria. The properties span the western city limit of Santa Maria, at and near 1650 Black Road (Lat/Long 34.92649, -120.48364). The Windset Farms properties occupy land situated in Santa Maria's flat, alluvial valley, amongst many other farms, as shown in Figure 1. The City of Santa Maria's wastewater treatment plant lies less than two miles north of Windset Farms and the Laguna County Sanitation District's wastewater treatment plant lies about two and a half miles south of Windset Farms.

Figure 1
Regional Aerial View

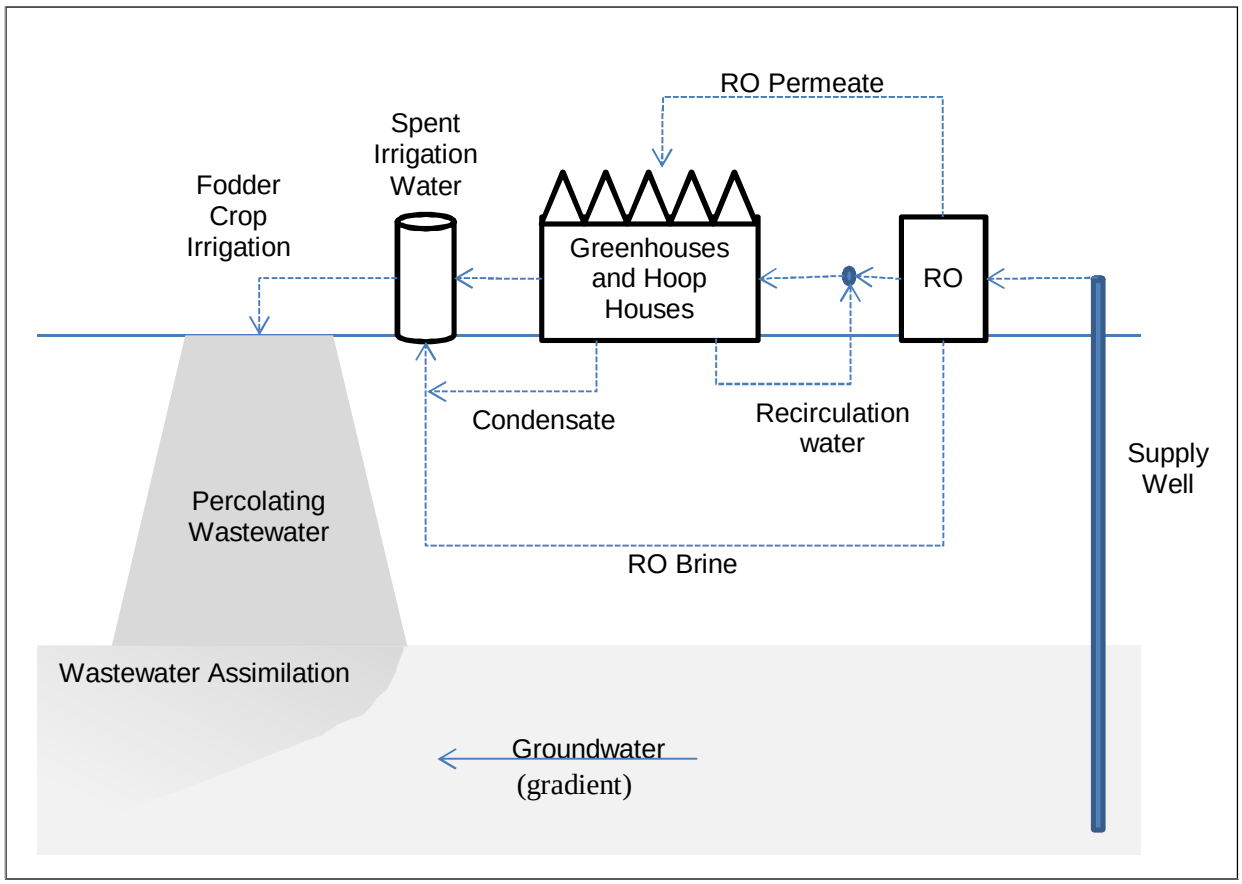


At 1650 Black Road, Windset Farms operates four 32-acre greenhouses that surround a packing facility. Windset Farms will also construct two 21.5-acre hoop houses for produce production. The greenhouses and hoop houses will share an effluent treatment and agricultural wastewater recycling operation.

At the greenhouses, Windset Farms grows a variety of crops (primarily tomatoes and cucumbers). At the hoop houses, Windset Farms intends to grow strawberries. All growing is conducted hydroponically using a coco peat substrate. The substrate supports the plants' roots, but does not provide nutrients to the plants. The plants obtain nutrients through fertigation.

As shown in the Figure 2, Windset Farms extracts groundwater, splits that groundwater into two reverse osmosis (RO) streams (permeate and brine), irrigates with the RO permeate stream, collects and recirculates the irrigation drainage, recombines any spent irrigation drainage with the RO brine stream, then recycles the recombined water for agronomic fodder crop irrigation.

Figure 2
Windset Farms Water Flow Diagram



Santa Maria Water Quality Setting
Windset Farms discharges to land within the Santa Maria River watershed. Although Windset Farms discharges to land (the discharge ultimately percolates to groundwater), streams in the lower Santa Maria River watershed all have groundwater as a significant source of flow.[1] Surface water and groundwater quality are interrelated. Water Board staff is currently developing a salt TMDL for the Santa Maria River watershed.

[1] Santa Maria Watershed TMDL – Salt Modeling Report, Tetra Tech, Inc., March 1, 2013

Surface Water –Windset Farms is about 3,000 feet south of a tributary of Green Canyon Creek (Green Canyon Creek is a tributary of Orcutt Creek), about 3,000 feet north of a tributary of Orcutt Creek, and about 2.5 miles east of Orcutt Creek. Windset Farms is about 4.3 miles south of the Santa Maria River.

California's 2010 303(d) list of impaired water bodies identifies surface waters in the Santa Maria River watershed as being impaired for fecal indicator bacteria, nutrients, toxicity, pesticides, and salts. TMDL projects for fecal indicator bacteria, nutrients, toxicity and pesticides have been adopted by the Central Coast Water Board. Those TMDLs include implementation plans. Implementing a TMDL for an impaired water body involves applying the pollution control practices necessary to reduce the pollutant loads to the extent determined necessary in the TMDL. These practices usually consist of point source control permits and/or non-point source control Best Management Practices (BMPs).

To address salt listings on the 303(d) list, the Water Board developed a model with Tetra Tech to understand hydrology and water and salt balances in the Santa Maria Valley. The model evaluated loading to groundwater and surface waters. The model indicated that irrigated agriculture is the largest source of salts (TDS) loading to the groundwater basin, as can be seen from Figure 3.

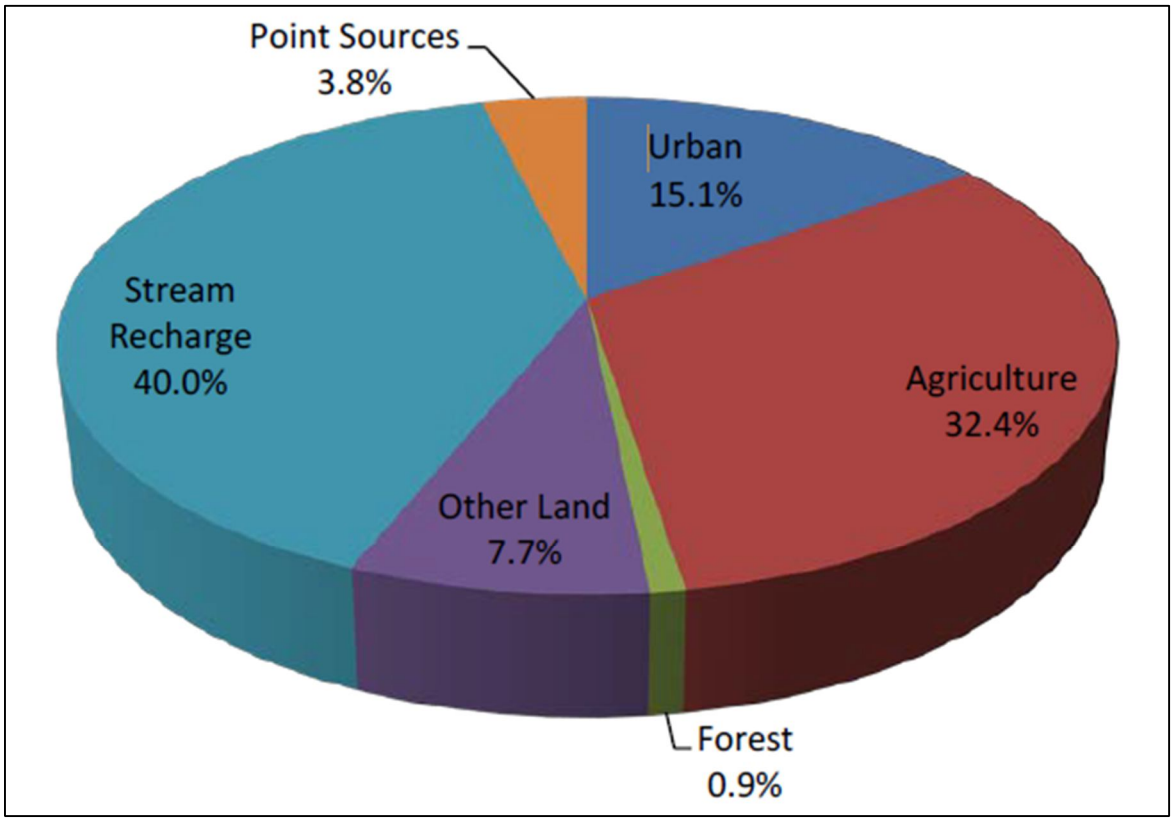
Groundwater - The State Water Resources Control Board established a Policy for Water Quality Control for Recycled Water (Recycled Water Policy). The Recycled Water Policy states that some groundwater basins in the state contain salts and nutrients that exceed or threaten to exceed water quality objectives established in the applicable water quality control plans (Basin Plans), and not all Basin Plans include adequate implementation procedures for achieving or ensuring compliance. Therefore, the Recycled Water Policy calls for local stakeholders to develop regional or sub-regional salt and nutrient management plans. Those salt and nutrient management plans should provide for management of salts and nutrients from all sources in a manner that ensures attainment of water quality objectives and protection of beneficial uses in the basin or sub-basin.

As part of the update to the Santa Barbara County Integrated Regional Water Management (IRWM) Plan under development by local stakeholders, a Santa Maria Valley salt and nutrient management workgroup prepared an assessment to evaluate sources, transport, and fate of "salts" and "nutrients" (nitrate and other forms of nitrogen) in surface water and groundwater within the Santa Maria Valley. The goals of the assessment were to identify regulatory requirements, gather data, summarize key issues, and provide recommendations to support future development of a Santa Maria Valley salt and nutrient management plan envisioned by the Recycled Water Policy.

The Santa Maria Valley salt and nutrient assessment found that, on a watershed-wide basis, salt inputs and outputs are balanced and sustainable; the salts entering the aquifer roughly equal the salts leaving the aquifer. The assessment determined that irrigated agriculture is the largest source of salt loading. When irrigation water is applied to crops, uptake by crops and evaporation leaves salts in the soil, which can build up over time. Salt accumulation in the root zone from irrigation occurs when salts are left in the soil due to insufficient leaching. As excess salts impair crop growth, growers must apply enough water (leaching fraction) to ensure that there is sufficient flushing to maintain root zone salt concentrations within crop tolerance levels. In the Santa Maria watershed, growers generally rely on a combination of winter rains and irrigation prior to planting ("pre-irrigation"), if needed, to ensure sufficient flushing. Irrigation during the

growing season occurs primarily via drip irrigation. Drip irrigation is a more efficient means of water delivery, but the reduced water volumes used can cause a greater accumulation of salts in soils due to decreased leaching.

Figure 3
Proportion of TDS Loads to the Santa Maria Aquifer from Different Source Categories



Source: Santa Maria Watershed TMDL – Salt Modeling Report, March 1, 2013

Facility Operations

Flow - Like conventional irrigated agriculture, Windset Farms uses water to meet crop demands. The amount of water needed depends on the type of crop, stage of growth and weather/climatic conditions. Windset Farms has a flow history that includes a maximum daily flow of 800,000 gallons per day from the four 32-acre greenhouses. At the time this staff report was prepared, the additional hoop house growing structures had not been constructed, so there is no historic flow data for those flows.

In addition to the RO brine, greenhouse condensate and irrigation drain flows, there are other measurable flows associated with Windset Farms' growing operations. Most of these flows lead to the denitrification biofilters and fodder crop discharge, with two of them flowing through the exterior roof drains into a storm water basin.

The flows plumbed through the denitrification biofilters are filter backwash, boiler exhaust condensate and water softener brine. With the exception of the commercial salt pellets for the water softener, no additional chemicals are added to these processes.

- The mechanical filters require regular backwashing. The backwash process utilizes fresh RO water resulting in a discharge mixture of clean water and irrigation water. This flow volume has been included historically in the numbers reported for irrigation drain flows and ranges between 60,000 to 120,000 gallons per day.

- The boiler exhaust passes through a condenser before being vented into the greenhouse for plant uptake. The boilers use natural gas and are tuned to ensure complete fuel combustion. Boiler exhaust condensate is primarily atmospheric water. Flow rates are not measured but are estimated to total approximately 5,000 gallons per day for the combined boilers.

- A water softener is available for use in the water distribution system. The softener is not a routinely used piece of equipment. Based on historic operation and estimated throughput flows, it generates a brine discharge somewhere between 5,000 to 15,000 gallons per month. Any brine generated is included into the RO brine flow and ultimately leads into the biofilters.

Two flows utilize the gutter drains and ultimately flow into the storm water retention basin. These are the roof washing water and evaporative cooler exchange water. Both use filtered well water as their source water, and under normal operation, no additional chemicals are added. These flows are not measured so estimates are provided based on system design throughput and historic run times.

- Each of the four greenhouses has a mechanical roof washing machine cleaning each roof an average of two times per month. It is estimated this process generates up to 307,200 gallons per month. These volumes decrease in periods of rainfall.

- The evaporative coolers require make-up water and routine flushing to maintain their efficiency. This flow is not measured but it is estimated that the water flushing generates up to 28,800 gallons per day. These volumes decrease in periods of cooler weather.

Pesticide Control - Windset Farms implements an advanced integrated pest management (IPM) program that has several components including: avoidance, monitoring, isolation, and treatment. Windset Farms employs the following controls:

Engineering controls:

- Closed greenhouse structure with bug screens under positive internal pressure
- Pass-through chambers between the greenhouses doors and the outside environment
- Greenhouse compartmentalization for additional isolation of crops within each greenhouse unit
- Cleaning of all harvesting totes and carts prior to re-entry into the greenhouse
- Temperature and humidity control to avoid mildew and other fungal issues

Administrative controls:

- Separation of greenhouse workforces, each with dedicated break and changing rooms
- Use of sterile uniforms for all greenhouse workers
- Standard Operating Procedures for tasks
- Extensive personnel training

- Dedicated staff to manage the IPM program including continual inspections and reporting

Pesticide use occurs after other non-pesticide countermeasures are deemed insufficient. When pesticide spraying is required, it is the job of the IPM staff to mix the pesticides and perform the application. IPM staff has specific training certifications for handling the chemicals. Spraying techniques are deployed that create an even cover over the affected areas while managing the surface tension of the spray mix at a level where it stays on the plant for maximum effectiveness. Over spraying to the point of dripping onto the floor or misting it into the air is wasting chemicals and is avoided. With regards to water quality, if chemicals were to drip off the sprayed plants, the floor is thick HDPE plastic and chemicals cannot leach into the soil. If drips were to happen at the exact same time as a significant water leak inside the greenhouse, the floor drains into the Irrigation Drain water collection system and cannot leach into the soil or groundwater. In the event spraying is done in a manner that would create a vaporized mist that could coat the inside of the glass and greenhouse structure, these chemicals would break down naturally in the UV radiation. These compounds have short half-lives and readily breakdown in sunlight on the order of 2-3 hours or more persistent form up to perhaps 4 days.

Along with spray applications, Windset does use systemic insecticides that are injected through the drip irrigation system. The systemic insecticides they apply have the potential to impact groundwater, but, based on their application methods, are not a risk to water quality at Windset Farms. They are not a risk because Windset isolates the injections to targeted areas and monitors flows to minimize overflow from the targeted rows into the irrigation return system. The amount of pesticide that could leave targeted area is very minimal and any residual pesticides would be reapplied to crops through the return system and eventually blended at very high rate of dilution in the entire waste systems. Finally, before reaching outdoor soils, any residue would have a long residence time for breakdown in the waste system. The final waste system includes storage in large holding tanks, flow through a several-acre woodchip-filled bioreactor and spray application to an alfalfa field.

Nutrient Control - Windset Farms addresses its nutrient threat by collecting all of its agricultural drainage water and treating that water using a nitrate bioreactor. Staff expects the nitrate bioreactor to reduce effluent nitrate concentrations to below California's drinking water maximum contaminant level of 45 milligrams per liter (as nitrate). This nutrient point source control complies with the Central Coast Water Board's nutrient TMDL implementation plan. In fact, Windset Farms proposes to go above and beyond controlling its nutrient discharges by remediating additional nitrate found in local shallow groundwater.

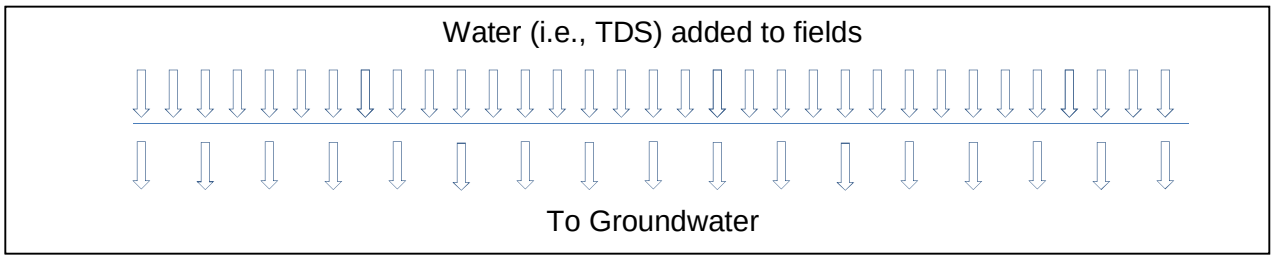
Windset Farms' nitrate bioreactor is sized to handle a peak flow; however, Windset Farms does not always produce that peak flow due to the vagaries of crop demand and meteorological factors. So, there will be many occasions where Windset Farms' nitrate bioreactor will have low flows. Low nitrate bioreactor flows can cause hydrogen sulfide gas generation problems if not properly managed. Also, the nitrate bioreactor will operate most efficiently under steady-state conditions.

Regionally, agricultural practices have resulted in nitrate-degraded shallow groundwater. To minimize low and fluctuating flow conditions in its nitrate bioreactors, Windset Farms proposes to install shallow groundwater extraction wells and add extracted shallow groundwater to the nitrate bioreactor flows. By extracting shallow groundwater and routing that groundwater through the nitrate bioreactor, Windset Farms would be remediating others' groundwater nitrate in addition to maintaining its optimal nitrate bioreactor flows. This practice would yield somewhere around 5.2

million gallons of basin water (i.e., water that would otherwise not be treated) being denitrified per year. Another benefit of remediating shallow groundwater nitrate is that the practice will also dilute Windset Farms' effluent TDS concentrations.

Total Dissolved Solids (TDS) Control – TDS is problematic in most Central Coast Water Board-regulated discharges. TDS treatment is not an economical option for nearly all dischargers. Source control is often the only current economic option to reduce effluent TDS. As mentioned earlier, when conventional farms apply irrigation water to crops, uptake by crops and evaporation leaves salts in the soil, which can build up until rain or intentional over-irrigation flushes it "away." The flushing of conventional farming's salts produces an "unseen," non-point source salt discharge, as depicted in Figure 4.

Figure 4
Conventional Farm TDS Discharge



While conventional farms' TDS discharges are hidden underground, they nonetheless exist. In fact (as stated earlier), irrigated agriculture is the largest source of TDS in the Santa Maria Valley, as Figure 3 depicts.

The Basin Plan says[2] that, for irrigated agriculture to continue production into the foreseeable future, the problem of gradual accumulation of salts in soils and waters must be faced and kept under control at acceptable levels. For each basin, not only do the rates of import and export of salts need to be in reasonably close balance, but the balance must also be maintained at a sufficiently low level of salinity to meet the quality demands of the various designated beneficial uses. This is often referred to as maintenance of a "favorable salt balance." The Santa Maria Basin's aquifer-wide salt model[3] indicates an approximately steady-state sustainable salt condition. The Basin Plan's Implementation Plan (found in Chapter 4) includes a discussion of the need for irrigation operations' salt management and improved salt management techniques. To a great degree, that discussion centers on irrigation efficiency. Windset Farms' exceptional water use efficiencies include,

- Losing less water to soil wicking and percolation (as mentioned earlier),
- Collecting and re-using "field drainage"
- Minimizing evaporative losses by controlling the growing climate

Windset Farms' water efficiency practices make its brine stream more obvious than conventional farming's brine streams; however, Windset Farms does not add any more salts than a

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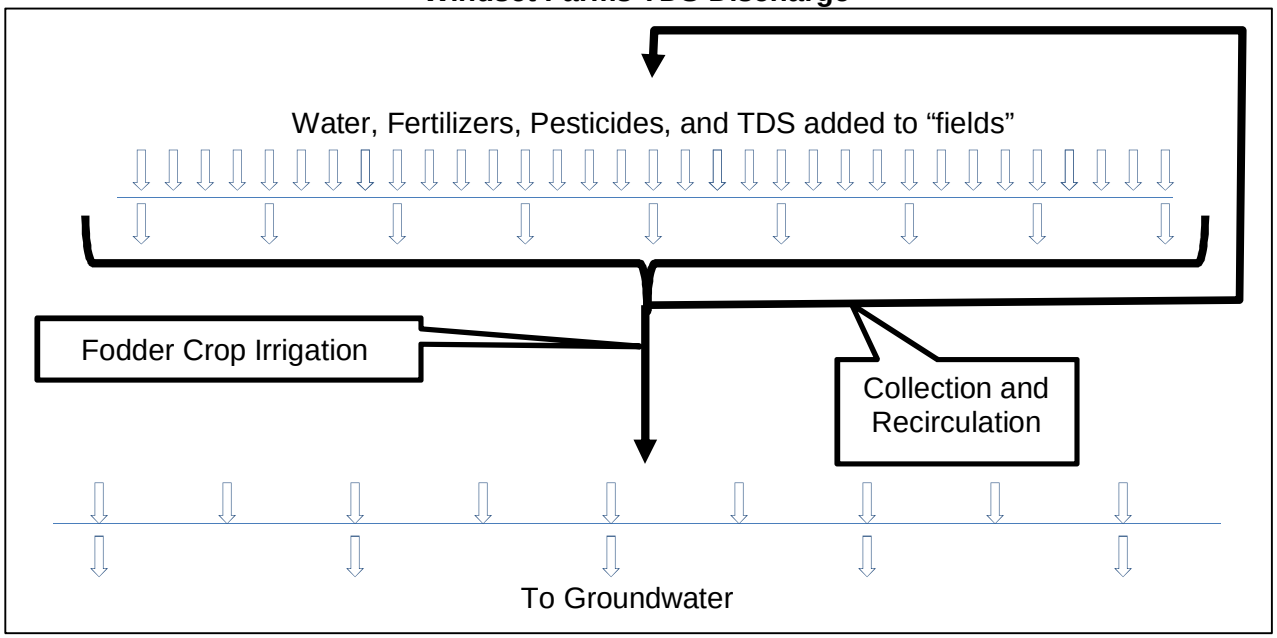
[2] See section VIII.C.3. Irrigation Operations - Need For Salt Management

[3] Santa Maria Watershed TMDL – Salt Modeling Report, March 1, 2013

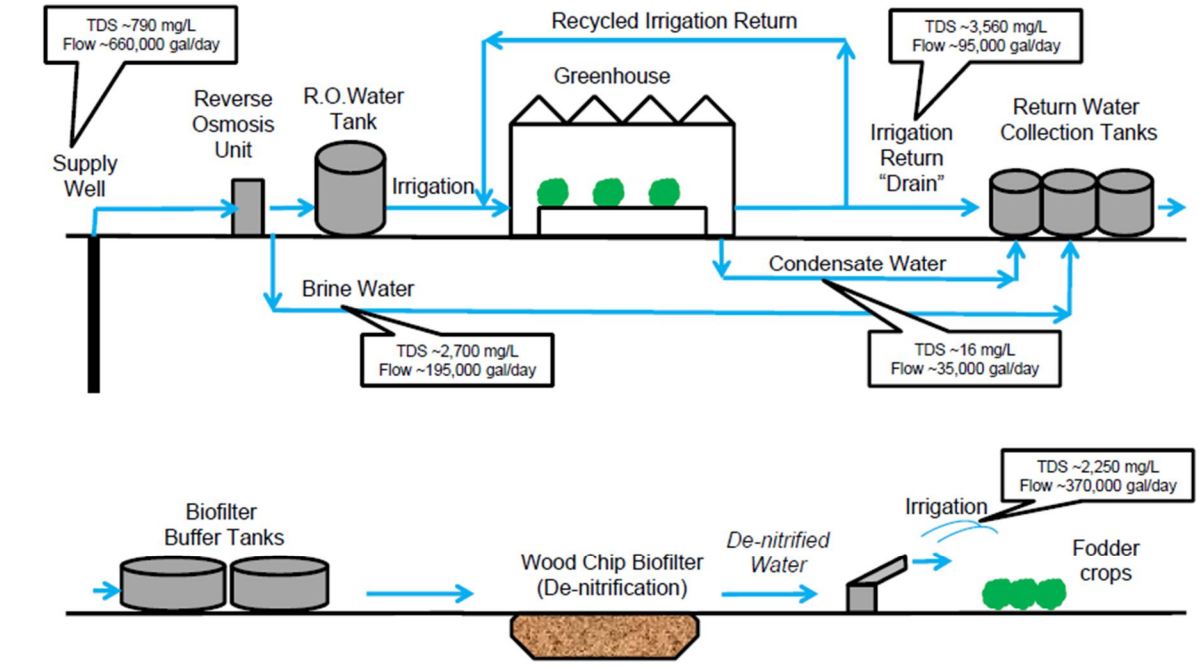
conventional farm. It is more likely that conventional farms produce a greater TDS load per crop. Conventional farms continually irrigate fields to replenish soil water. Each water application loads TDS minerals. Those minerals migrate to groundwater during flushing or over-irrigation. Windset Farms collects and re-uses migrating water, as depicted in Figure 5.

Figure 5
Windset Farms TDS Discharge



Farming is not a steady-state endeavor. Farmers adapt to weather changes and market changes (i.e., they change crops). Weather and crop changes can alter the way a farm is operated. Some farm operations may require more grading, water, fertilizers or pesticides. So, differing farm practices produce different discharges. Windset Farms' discharge volume and quality fluctuates. Figure 6's data was obtained from the period between August 2014 and February 2015. While Figure 6 attempts to provide an idea of Windset Farms' discharge volume and TDS concentrations, past performance may not accurately predict future discharge volumes and TDS concentrations. In the future, Windset Farms proposes to introduce a shallow groundwater stream into the woodchip biofilter. Introducing a shallow groundwater stream into the woodchip biofilter would tend to increase discharge volume and decrease TDS concentrations.

Figure 6
Windset Farms Water Process Flow



Notes:
- Total Dissolved Solids (TDS) data for Supply Well, Brine, Drain and Condensate were collected between February 2012 and August of 2014.
- TDS data for Irrigation discharged to the fodder crop were compiled from the April 2014 Notice of Violation and Request for Data Collection (NOV) reports.
- Flow volumes represent the period between August 2014 and February 2015, presented in the NOV reporting, and include application of the most recent Best Management Practices implemented by Windset Farms with regards to Drain water recirculation and recycling.

In addition to collecting and re-circulating salts accumulated in soil prior to discharge, Windset Farms also hauls off a portion of accumulated salts. Their "soil" is coco peat. Coco peat has some cation exchange capacity, so it can bind salt cations. Because Windset Farms frequently replaces the coco peat, Windset Farms removes salts bound in their "soil." Windset Farms' discarded "soil" gets recycled as compost by others at an off-site location. In that respect, Windset Farms generates less salt loading than conventional farms. So, Windset Farms implements maximal salt management techniques recommended in Basin Plan Section VIII.C.4.

From a Santa Maria aquifer perspective, 1) the *Santa Maria Watershed TMDL – Salt Modeling Report*, and 2) the *Santa Barbara County Integrated Regional Water Management Plan, Salt and Nutrient Planning Workgroup's Santa Maria Valley Groundwater Assessment* suggest that aquifer TDS inputs and outputs are balanced and sustainable. The salts entering the aquifer roughly equal the salts leaving the aquifer and meet the quality demands of the various designated beneficial uses. Given the scale of the aquifer model, the Windset Farms discharge is unlikely to alter the salts balance and sustainability. As shown in Figure 7, potential water users within Windset Farms' assumed assimilation gradient consist of agricultural users for many miles. It appears that the nearest municipal supply wells are near the City of Guadalupe, which is miles downgradient. Windset Farms' discharge is most probably assimilated by that time, and is less than that of other closer irrigated agriculture operations.

Figure 7
Photo Indicating Water Users in the Vicinity of Windset Farms

Proposed Order Contents

Since Windset Farms is an agricultural operation that does not fall within the scope of the Central Coast Water Board's Ag Order, or any other general order, staff is proposing to regulate Windset Farms using individual WDRs. The individual WDRs contextualize the regulation of Windset Farms within the Central Coast Water Board's framework of goals, plans, policies, and priorities. The individual WDRs hybridize the differing approaches that the Central Coast Water Board takes with irrigated agriculture and point-source discharges, tending towards the non-point source approach. Like the agricultural control strategy, the proposed individual WDRs emphasize BMP implementation over a strict numeric focus on effluent concentrations as they relate to numeric Basin Plan water quality objectives.

The threats from Windset Farms' discharge include pathogens, putrescible organic material, pH, earthen materials (i.e., sedimentation), pesticides, fertilizers (i.e., nutrients), and soluble inorganics (i.e., "salts," which are represented by total dissolved solids). How the proposed WDRs address those threats is summarized below.

Flow – The Water Board has not imposed flow limits on other irrigated agriculture businesses. Windset Farms operates an irrigated agriculture business. To regulate Windset Farms consistently with other with irrigated agriculture businesses, the proposed WDRs do not include a flow limit. Like other farms, Windset Farms will use and waste water as necessary to produce their crops. While the proposed WDRs do not include a flow limit, the monitoring and reporting program proposes flow reporting.

Fecal Indicator Bacteria - Fecal indicator bacteria indicate the presence of pathogens. Windset Farms discharges to land. A properly functioning land disposal area holds and deactivates pathogens. The proposed WDRs require proper discharge to land. Windset Farms' discharge to land constitutes a satisfactory pollution control practice in conformance with the fecal indicator bacteria TMDL.

Putrescible Organic Material - Windset Farms discharges organically weak wastewater to land. A properly functioning land disposal area will hold putrescible organic material in the soil and soil bacteria will stabilize the putrescible organic material. The proposed WDRs require a properly functioning land disposal area.

pH - A properly functioning land disposal area will buffer pH. The proposed WDRs require a properly functioning land disposal area.

Earthen Materials - Because Windset Farms' growing area is paved and lined, there is little threat from the discharge of earthen materials. The proposed WDRs require Windset Farms to confine its farming to paved and lined areas.

Pesticides -The proposed WDRs require Windset Farms to continue its pesticide reduction BMPs.

Nutrients -The proposed WDRs require Windset Farms to continue bioreacting its agricultural drainage to reduce effluent nitrate concentrations to acceptable levels. The proposed WDRs also require Windset Farms to remediate additional, non-Windset Farms nitrate found in local, shallow groundwater when Biofilters 1 and 2 have excess denitrifying capacity.

Total Dissolved Solids (TDS) – The Water Board has not imposed TDS limits on other individual irrigated agriculture businesses. Windset Farms operates an irrigated agriculture business. To regulate Windset Farms consistently with other with irrigated agriculture businesses, the proposed WDRs do not include a TDS limit. However, the proposed WDRs require Windset Farms to implement an ongoing salt and nutrient management program with the intent of reducing salt loading.

Monitoring - Conventional on-site groundwater monitoring at Windset Farms would provide very local, very specific information about the immediate impact of Windset Farms' discharge. That information would likely reveal that Windset Farms' discharge results in an assimilation gradient. Such gradients can be tolerated as long as the assimilation gradient does not impair beneficial uses of local water and maintains greater water body sustainability. So, conventional on-site groundwater monitoring would confirm the expected, but not provide useful data about the overall health of the watershed.

Lower Santa Maria surface waters have groundwater as a significant source of flow.[4] So, surface and groundwater quality are interrelated. Surface water and groundwater salts need to be understood and controlled. Under the Santa Barbara County Integrated Regional Water Management Plan,[5] a Salt and Nutrient Management Plan (SNMP) workgroup is attempting to understand Santa Maria groundwater salts. Also, in a parallel (but separate) process, a Santa Maria River salt TMDL is under development. Both the TMDL and the SNMP have major data gaps that need filling. Rather than perform conventional on-site groundwater monitoring at Windset Farms, the discharger is developing a proposal to provide funds to help fill those data gaps.

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[4] Santa Maria Watershed TMDL – Salt Modeling Report, Tetra Tech, Inc., March 1, 2013

[5] Santa Maria Valley Groundwater Assessment, Santa Barbara County, California, Salt and Nutrient Planning Workgroup, Santa Barbara County IRWM Plan 2013, April 12, 2013

Specifically, the discharger is developing a proposal to fund the acquisition, installation, and operation and maintenance of two stream gages that will monitor the two perennial streams that flow out of the Santa Maria groundwater basin. The gages will provide information on the amount of water and salts leaving the basin. Understanding the inputs and outputs of the basin are crucial for determining the basin's water and salt balance, which is a key component of the Salt TMDL and the SNMP effort. The gages will also serve to monitor the flow into sensitive and highly impaired aquatic habits of Oso Flaco Lake and the Santa Maria Estuary. Nutrient and pesticide TMDLs have been developed for these waters and the gages will provide valuable information on loading. The proposed stream gages will provide more scientifically valuable information than would be provided using conventional on-site groundwater monitoring. Additionally, the Water Board's irrigated agriculture program implements cooperative groundwater monitoring intended to identify impacts to groundwater quality. In the Santa Maria Valley, many domestic and agricultural wells have been monitored to determine regional water quality and trends, including wells in the vicinity of Windset Farms and downgradient from Windset Farms. So, while Windset Farms proposes no on-site groundwater monitoring, groundwater monitoring will occur in that area.

Windset Farms' monitoring proposal will be consistent with other related monitoring approaches. For example, to determine the effectiveness of its irrigated agriculture regulatory program, the Central Coast Water Board implements, for the most part, a regional monitoring strategy that tends to take scrutiny/emphasis off of individual farms. Windset Farms' proposal to provide funds to help fill regional data gaps is in the spirit of the irrigated agriculture regulatory program's regional monitoring approach. Also, the monitoring and reporting programs for the nearby wastewater treatment plants (i.e., City of Santa Maria and Laguna County Sanitation District) allow those entities to propose regional projects in lieu of on-site monitoring.

Compliance History - Windset Farms' first phase involved operating two greenhouses with an associated packing operation. Windset Farms claims that they did not anticipate wastewater discharges problems because its Santa Maria facility's design was based on their Delta, Canada facility's design, and their Delta, Canada facility did not have a salt issue to deal with (its source water is mostly relatively pure snow melt or rain water collected in large basins). As such, no mention of discharge was included in the original project description beyond the sanitary discharge from the septic system. In 2012, after construction of its Santa Maria greenhouses 1 and 2 went on line, Windset Farms realized that the conditions in California (weather and starting water quality requiring desalination) were significantly different than the conditions in Canada. So it added wastewater tanks, constructed the entire wastewater handling system, and approached the Central Coast Water Board staff to obtain a process wastewater permit.

When Windset Farms revealed their process wastewater discharge to staff, RWQCB staff 1) considered an enforcement action for illegally discharging and 2) began the process of regulating Windset Farms' process water discharge. After staff confronted Windset Farms with illegal discharge allegations, Windset Farms eagerly took cooperative actions to satisfy staff's needs. Windset began collecting data in cooperation with the RWQCB staff and submitted an initial Report of Waste Discharge (ROWD) on November 15, 2012. RWQCB staff direction at that time was to continue data collection while aggressively pursuing internal process improvements to reduce or eliminate waste flows. Data collection has been continuous ever since. Windset Farms performed several technology studies at bench-level and field–level pilot tests to evaluate methods of reducing or removing compounds form the waste stream. With the exception of the wood chip de-nitrification technology, none of the other technologies was readily applicable to the greenhouse growing process. It was during this technology evaluation process that the RWQCB staff took enforcement by issuing a Notice of Violation (NOV). While Windset Farms was

collecting data, staff determined the ROWD was incomplete and issued an NOV to foment a complete ROWD. Windset Farms complied and the NOV requirements were satisfied. Because of Windset Farms' cooperation, staff no longer proposes enforcement action against Windset Farms.

ENVIRONMENTAL SUMMARY

The City of Santa Maria is the lead agency pursuant to the California Environmental Quality Act (CEQA) (Cal. Pub. Res. Code Section 15367). As the lead agency, the City certified a Mitigated Negative Declaration on May 27, 2009, for the project. The Mitigated Negative Declaration did not identify any potentially significant environmental effects with respect to the adoption of these waste discharge requirements and within the jurisdiction of the Central Coast Water Board.

The Central Coast Water Board is a responsible agency pursuant to CEQA (CEQA Guidelines Section 15096). The Central Coast Water Board has considered the Mitigated Negative Declaration and makes its own conclusions in this Order on whether and how to approve the waste discharge requirements for the project. Since the Mitigated Negative Declaration has not identified any potentially significant environmental effects within the Central Coast Water Board's jurisdiction, the Central Coast Water Board is not required to make any specific finding pursuant to CEQA Guidelines 15096. The proposed waste discharge requirements will result in improved water quality in the Santa Maria Basin since they allow the Discharger to remediate shallow groundwater nitrate and improve the understanding of the Santa Maria groundwater basin through regional monitoring.

These proposed waste discharge requirements are for an existing facility and are exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000, et. seq.) in accordance with Section 15301, Article 19, Chapter 3, Division 6, Title 14 of the California Code of Regulations.

COMMENTS

Windset Farms

1. Windset decided to relocate the dual hoop house project from the County property west of Black Road onto the parcel where the glass greenhouse structures are located. All functional aspects of the hoop house project remain the same, except the location.

Staff Response: Staff revised the staff report and proposed order accordingly.

2. Addition of the hoop house structures will require an expansion of Windset Farms' sanitary wastewater facility. Windset Farms is currently designing a sanitary system expansion.

Staff Response: Originally, staff proposed to consolidate regulation of the Discharger's wastewater streams, including the sanitary wastewater stream. After some thought, staff now proposes to maintain the Discharger's existing enrollment under general waste discharge requirements for small sanitary systems and regulate the Discharger's other waste streams under the proposed order. The Discharger's existing enrollment under general waste discharge requirements for small sanitary systems will allow more flexibility in sanitary wastewater regulation.

3. The WDR's Finding 7 description of the boiler blowdown is incorrect. The boilers heat water that remains in a closed loop system from the boilers to the heat storage tanks, through the greenhouses and back to the boilers. There are no water discharges from the heating system.

Staff Response: Staff deleted boiler blowdown from the waste stream description.

4. Windset Farms asked for clarification about the applicability of Prohibition A.3., which prohibits the bypass of the treatment facility and discharge of untreated or partially treated wastes.

Staff Response: Prohibition A.3. should ensure that every waste stream that was intended to be treated gets treated.

5. Windset Farms asked how Groundwater Limitations B.13.—the fecal coliform organisms limit—is to be measured and confirmed.

Staff Response: At this point, the monitoring and reporting program does not require groundwater monitoring or reporting of fecal coliform organisms.

6. Windset Farms suggested that Reporting Provision No. 3's call for certified operator and operation and maintenance manual information was not necessary because that information is meant for sanitary facilities.

Staff Response: Staff agrees. Those reporting requirements were deleted.

Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties (GSA)

The GSA is a non-profit organization representing the interests of Central Coast farmers involved in the production and transport of edible and ornamental crops. The GSA represents many segments within agriculture, from row crops to cut flowers to shipping to labor, including numerous members who farm down-gradient of Windset Farms. The GSA's comments are itemized and paraphrased below, along with staff's responses.

1. The GSA objects to comparisons made between Windset Farms and other farms currently regulated through the Ag Order, stating "We believe an individual WDR should focus on a particular site's unique opportunities and challenges in protecting beneficial uses, rather than making peculiar comparisons between disparate types of discharges and situations."

Staff Response: Windset Farms is a farm. It is also a peculiar farm in that it implements BMPs to a much greater extent than conventional farms. Comparing Windset Farms to more conventional farms is a relevant and informative necessity. It would be peculiar to discuss Windset Farms without any context.

2. The GSA questioned the need for staff's crop yield comparisons and expressed concern that the Water Board is pursuing vertical farming as a desired outcome of the irrigated lands regulatory program.

Staff Response: The Water Board's desired outcome of the irrigated lands regulatory program is to protect the quality of receiving waters. Protecting water quality may include minimizing farming land-use disturbances.

3. The GSA believes that the staff report oversimplified how Central Coast farmers manage salts and the GSA questions the reliability of staff's statement that irrigated agriculture poses the greatest salt and nutrient threat to the Santa Maria Valley's water quality.

Staff Response: While staff could have gone into greater detail about how Central Coast farmers manage salts (and many other topics), such a discussion would have made the staff report relatively more unwieldy. Ideal staff reports would be concise and informative, which is a difficult balance to achieve given the wide-ranging interests of a staff report's audience. Some simplification is necessary for the sake of brevity. Staff believes a more thorough discussion of how Central Coast farmers manage salts would have been an unnecessary digression.

Water Board staff formed a technical advisory committee (TAC) that included the following stakeholders: the City of Santa Maria, the Laguna County Sanitation District, and local growers. That TAC effort led Water Board staff to commission a report titled, *Santa Maria Watershed TMDL – Salt Modeling Report, Tetra Tech, Inc., March 1, 2013*. That report's model results were presented to the TAC. The TAC continued on as the IRWM salt and nutrient planning group for the Santa Maria basin and produced another report evaluating sources, transport and fate of "salts" and "nutrients" (nitrate and other forms of nitrogen) in surface water and groundwater within the Santa Maria Valley. The two reports mentioned above serve as the basis for staff's statement that irrigated agriculture poses the greatest salt and nutrient threat to the Santa Maria Valley's water quality.

The GSA's comment letter referenced the IRWM report (mentioned above), which indicates that the GSA is familiar with some of the scientific background information underlying staff's statement about salt and nutrient threats. The GSA mentioned naturally occurring salts in surface and subsequently groundwater inflows as playing play a dominant role in existing salts in the basin. These inflows occur in large part to recharge the basin after extensive pumping for irrigated agricultural production. Therefore irrigated agriculture, along with some municipal and industrial pumping, are indirectly responsible for inflows of water and the natural salts in the water.

4. The GSA believes that the staff report's Figure 4 is an inaccurate portrayal.

Staff Response: Staff agrees, removed Figure 4 from the Staff Report, and renumbered the figures.

5. The GSA points out that Windset Farms' voluntary remediation of others' groundwater nitrates benefits Windset Farms by diluting Windset Farms' effluent TDS.

Staff Response: Staff agrees that Windset Farms' voluntary remediation of others' groundwater nitrates benefits Windset Farms. As the staff report pointed out, the arrangement is mutually beneficial to Windset Farms and to the Water Board's goals. If other farmers volunteered to remediate others' groundwater nitrates, staff would support such proposals (especially if that activity also reduces other problems).

6. The GSA wondered if off-site coco peat compositing and fodder crop use truly removed salts from the Basin.

Staff Response: A county-permitted green waste composting operation removes Windset Farms' spent coco peat from the Windset Farms property. The green waste composting operation is located within the basin, but supplies compost to customers in the greater tri-counties area, which includes customers outside of the Santa Maria Basin.

The fodder crop is currently used by the cattle on the site, but beginning in July Windset Farms will harvest the fodder crop for off-site sale. Off-site sales could be to entities outside the Santa Maria Basin.

7. The GSA finds staff recommendations to be particularly subjective.

Staff Response: Something that is subjective cannot be verified using concrete facts. Staff believes that it can objectively support its recommendations and staff would welcome any GSA effort to objectively demonstrate any error in staff's recommendations. Staff believes that Windset Farms' BMPs are praiseworthy. Objectively, to the degree that Windset Farms does, other farms don't:

- Protect stormwater, surface water, and groundwater from farm pollutants by fully enclosing and lining their growing operations
- Eliminate the need for seasonal grading (reducing siltation threats)
- Minimize land use impacts by achieving high crop yields
- Reduce the need for pesticides by installing physical barriers to pests
- Recycle their ag drainage to grow more crops (high water use efficiency)
- Recycle their waste fertilizers to grow more crops
- Treat their waste ag drainage for nitrate
- Remediate others' nitrate pollution

8. The GSA objects to the following monitoring requirement (MRP page 7):

   "If the Discharger monitors any pollutant designated more frequently than is required by this Monitoring and Reporting Program, the results of such monitoring shall be included in the monitoring reports.".

   Regarding the above, the GSA said, "We see value in encouraging the voluntary collection and review of information to improve management."

Staff Response: The monitoring requirement is a standard point-source WDR language. Windset Farms did not object to the requirement. The monitoring requirement does not discourage Windset Farms from the voluntary collection and review of information to improve management. The monitoring requirement does not directly affect entities other than Windset Farms.

9. The GSA questions the stream gage choice in lieu of groundwater monitoring and wonders if other options would be better.

Staff Response: The Water Board needs to understand the Santa Maria basin. Modeling basins is a standard approach to basin control. So, the Water Board needs a good basin model. A model's basic, first data needs are to understand the basin's major basin inputs and outputs. The proposed stream gages will provide data for the Santa Maria basin's primary outputs. Thus, the proposed stream gages are of utmost importance for understanding the Santa Maria basin's salts. Staff believes that other basin monitoring proposals would not be as scientifically valuable as the proposed stream gages.

While the Oso Flaco gage site is not immediately down gradient of Windset Farms, it is within the groundwater basin and without this monitoring we cannot answer the basin-wide questions of stream outflow. Staff did consider alternative programs for the monitoring such as cooperative ag monitoring programs and determined the USGS to be the best program for the monitoring. Continual flow monitoring is difficult and the USGS consistently provides high quality data and has an ongoing relationship with the county to monitor streams and groundwater.

10. The GSA seeks understanding about how alternatives to groundwater monitoring would conflict with other requirements outlined in the WDR and MRP.

Staff Response: Immediately downgradient of Windset Farms, the current water uses are for agricultural purposes. Staff understands the GSA's comment to convey a concern that GSA's members immediately downgradient of Windset Farms may be impacted by Windset Farms' discharge and that accepting an alternative to groundwater monitoring would eliminate the opportunity to monitor the impact of Windset Farms' discharge on the immediate downgradient users.

The goals of the proposed WDR and MRP are the same goals of the Water Board's irrigated agriculture order—to protect, enhance, and restore water quality. As the staff report states, staff expects a TDS assimilation plume originating at the Windset Farms discharge area. This is likely the case with most discharges—including point-source discharges and farm discharges. While staff is sensitive to impacts caused by discharges, staff does not expect Windset Farms' discharge to render useless any current water uses immediately downgradient of Windset Farms.

Fortunately, the Water Board's irrigated agriculture program implements a cooperative groundwater monitoring intended to identify impacts to groundwater quality. In the Santa Maria Valley, many domestic and agricultural wells have been monitored to determine regional water quality and trends, including wells in the vicinity of Windset Farms and downgradient from Windset Farms. So, while Windset Farms proposes no on-site groundwater monitoring, groundwater monitoring will occur in that area.

Windset Farms is proposing to contribute to greater salt and nutrient management efforts in lieu of individual groundwater monitoring. Staff supports that proposal because such a contribution will provide more scientific value than individual groundwater monitoring. While such a proposal does not provide the assurances to immediate downgradient users that would be provided by individual groundwater monitoring, staff feels relatively secure given that the existing regional groundwater monitoring effort is in effect.

ATTACHMENTS

1. Proposed Waste Discharge Requirements Order No. R3-2015-0007, including proposed Monitoring and Reporting Program No. R3-2015-0007
2. Windset Farms' comments dated March 30, 2015
3. Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties' comment letter dated April 1, 2015

RECOMMENDATION

Staff recommends adoption of Order No. R3-2015-0007 as proposed.