Clean Water Coalition

OF NORTHERN SONOMA COUNTY

January 12, 2015

Matthias St. John, Executive Officer
North Coast Regional Water Quality Control Board
5550 Skylane Blvd. Santa Rosa, CA 95403

File: Healdsburg Wastewater Treatment, Reclamation and Disposal Facility, WDID No. 1B82046OSON, Waste Discharge Requirements Order No. R1-2010-0034

Subject: Long-term Use of Tertiary Recycled Water for Vineyard Irrigation

Dear Mr. St. John,

As stated in previous written comments and the comments below, the Clean Water Coalition of North Sonoma County (CWC) has serious concerns with the timing, volume and terms for treated wastewater application to vineyards with alluvial soils in close proximity to ground water. We are concerned that application of wastewater in the areas identified in the Addendum to Healdsburg's 2005 Final Environmental Impact Report (FEIR), including the Middle Reach of the Russian River (Middle Reach), at rates seriously in excess of actual hydraulic agronomic rates could lead to irreversible degradation of ground water quality.

The CWC submits the attached October 8, 2014 Technical Study into the record: "*Response to Walker Report entitled Programmatic Operation and Management Technical Report for Micro-Irrigation on Vineyards in the Healdsburg Area.*" And, all of the previous technical studies submitted by the CWC and Healdsburg, as listed in the Addendum, are incorporated into this letter by reference.

The CWC has issues with long-term delivery of treated wastewater for drip irrigation in vineyard areas covered in Healdsburg's "*Addendum to Final Environmental Impact Report, City of Healdsburg Wastewater Treatment Plant Upgrade/Seasonal Irrigation Reuse Project*" approved on April 14, 2014. And, we request that the North Coast Regional Water Quality Control Board (NCRWQCB) staff's May 1, 2014 letter granting Healdsburg permission to proceed with short-term wastewater irrigation not be continued at the end of the period covered by the General Order until the issues raised

for the project are resolved.

The NCRWQCB's decision granting permission to provide treated wastewater to vineyards in the short-term areas identified by Healdsburg should not set a precedent for any future decision by the NCRWQCB to grant permission for long-term use of treated wastewater. The Technical Studies, User Agreements and other documents that were relied on by the NCRWQCB staff in making its short-term drought emergency determination have significant errors in methodology and assumptions that were not subject to public review and comment as required by the Master Use Permit.

As there was no notification or timelines for public comment in the short-term decision process, the CWC may submit additional comments into the record. Our current comments cover four subject areas relative to long-term wastewater irrigation:

1. HEALDSBURG'S WALKER TECHNICAL REPORT SERIOUSLY OVERSTATES THE HYDRAULIC AGRONOMIC RATE FOR MIDDLE REACH VINEYARDS

The Walker Report grossly overstates the hydraulic agronomic rate, and is in serious conflict with results from the *2012 Middle Reach Russian River Vineyard Irrigation Demonstration Study*, Mark Greenspan (Field Study), attached as Appendix A of Healdsburg's report, yet totally disregarded.

The Walker Technical Report concludes that the hydraulic agronomic rate threshold necessary to minimize ground water degradation is 75% of Full Crop Evapotranspiration Rate (ETc). However, use of the 75% ETc threshold would allow significantly more wastewater irrigation than is required by these vineyards. Thus, the proposed rate of irrigation will not provide protection of the underlying, high quality groundwater aquifer.

Fall and winter rains, which in this region are 35-40 inches per season, will move residues of leachable contaminants present in the soil below the root zone and into the groundwater. After the vines enter dormancy, leaching from typical rainfall may threaten groundwater quality if high residues of leachable materials are present in the soil.

The deficiencies and flaws of Healdsburg's Technical Report with respect to the determination of the proper agronomic rate are discussed fully in the attached document: *Response to Walker Report entitled "Programmatic Operation and Management Technical Report for Micro-Irrigation on Vineyards in the Healdsburg Area"* from Mark Greenspan dated October 8, 2014. The significant flaws are in two categories:

1. Timing: Seasonal initiation of the irrigation cycle; and
2. Over Irrigation: Percentage of ETc applied.

Walker Methodology is Theoretical and Flawed: The stated objectives of the methodology used in the Walker Technical Report to define application of water at agronomic rates, as required, were to define through use of theoretical models: 1) the amount of water required to prevent excessive vine stress, and 2) the amount of nitrogen that could be applied to provide for grape quality and yield but not damage

vines. The report also relied on the Yates theoretical model to define the amount of salinity that could be applied to prevent the Total Dissolved Solids (TDS) in wastewater percolating to groundwater exceeding the drinking water standard.

These definitions, devoid of full explanation and analysis, were then used to establish hydraulic, nitrogen, and salinity agronomic rate thresholds. The Technical Report stated, "Compliance with agronomic rates will be assessed by comparing actual rates on each use site with the lowest of the thresholds presented in Table 4".

Based on Healdsburg's water quality and the geology and hydrology of the Middle Reach, the most sensitive of these three thresholds for each site will certainly be the hydraulic agronomic rate. Therefore, the CWC comments focus on the inadequacy of the Technical Report methodology, which discussed two methods for defining the hydraulic agronomic rate for each use site:

1. Actual field data with reference to the Middle Reach Field Study, and the
2. Theoretical evapotranspiration model derived by University of California Extension Service.

Field Study Methodology: The Field Study aimed to demonstrate an effective range of irrigation application rates and management practices using a set of measurement tools that provide information on soil moisture reserves and vine water status. Resulting data approximates agronomic irrigation rates designed to avoid undesirable levels of vine stress and deep percolation beyond the root zone. Use of soil moisture and vine water status measurement equipment provides a solid basis for interactive irrigation scheduling that avoids both over-irrigation and undesirable levels of vine stress.

Results of the Field Study were described and summarized in the Walker Report, Table 1, page 6, however these results were not utilized. The Field Study demonstrated through actual measurements that irrigation requirements on different soil types to prevent vine stress ranged from less than 1 in/acre/year to about 3-4 in/acre/year. These experimentally determined irrigation requirements ranged from 5 to 40% of theoretically calculated full crop evapotranspiration rates (Full ETc).

Theoretical Model Methodology: The Walker Report described the theoretical calculation of irrigation requirement defined by the University of California Extension Service on pages 7 and 8, with a reference evapotranspiration rate obtained from the closest CIMIS station (Windsor). The reference evapotranspiration rate is factored using a crop coefficient for a specific vineyard, considering canopy growth, amount of shaded ground and vine and row spacing. This provides the Full ETc.

After discussion of the Field Study and theoretical irrigation requirement methods and results, the Walker Technical Report defaulted to a hydraulic agronomic rate threshold of 75% of Full ETc for ALL vineyards in the expanded region proposed for wastewater irrigation by the Addendum to the FEIR.

There is absolutely no discussion of the reason for or justification for what appears to been arbitrary default choice to 75% of Full ETc. There is also no discussion of why a theoretical methodology was used when actual Field Studies for irrigation requirements in the actual vineyards in question was available and disregarded.

Calculating irrigation requirements based on 75% of Full ETc would result in about 8 to 12-in/acre/year application of treated wastewater, when actual irrigation requirements determined in the Field Study ranged from about 1 up to 3- 4 in/acre/year.

CWC Concerns and Request: The theoretical methodology results in irrigation requirements that appear to be disposal rates, far in excess of the agronomic rate. A likely reason the theoretical ETc provides hydraulic agronomic rates significantly in excess of actual irrigation requirement is that the methodology ignores the significant soil moisture storage that occurs in these alluvial soils after winter rains.

Based on the results of the Field Study and further analysis by Mark Greenspan PhD attached, it is clear to the CWC that use of 75% of ETc to determine hydraulic agronomic rates for these vineyards would result in application of wastewater seriously in excess of actual irrigation requirements and could lead to irreversible degradation of ground water quality.

The unsupported default to 75% of ETc used in the Walker Technical Report must not be allowed to carry forward into the long-term permitting process.

The CWC requests that any permit to allow long term irrigation of these vineyards soils, which overlay a large, shallow, high quality groundwater aquifer require vineyard specific determination of actual irrigation requirements using appropriate field studies. Given the proposed irrigation area is the Sonoma County Water Agency's drinking water aquifer, it is prudent to provide maximum protection of this aquifer and adjacent surfaces waters for beneficial uses as required by the Clean Water Act.

2. THE MONITORING PROVISIONS IN THE SHORT-TERM USER AGREEMENTS ARE NOT SUFFICIENTLY SPECIFIC AND VERIFIABLE TO ENSURE THAT AGRONOMIC RATES ARE NOT EXCEEDED.

To ensure application of treated wastewater protects against exceeding agronomic rates, it is necessary to know the date, duration, and rate of application for each vineyard block. And, it is important to independently verify that treated wastewater is not applied at greater than the agronomic rate.

The currently proposed User Agreements and the self monitoring report form contained in Appendix D of the May 2014 *Programmatic Operations Management and Technical Report* do not require the user to provide sufficient information to determine if agronomic rates are exceeded and should not set a precedent for long-term User Agreements.

Any long-term agreement and monitoring report must provide verifiable data for the amount of water applied to each vineyard block, including the date and hours of application, and the number of vines in each block.

Monitoring Devices Required: The NCRWQCB should require monitoring devices to provide sufficient data to verify application at agronomic rates and reports of such data to allow independent verification. From this data, along with corresponding weather and other data from vineyards in the vicinity, it will be possible to determine if wastewater is

being applied at agronomic rates reasonably associated with the water needs of vines in the area in question at specific points in time.

Site Specific Plans Required: Since soil types vary significantly within the areas proposed for wastewater irrigation, it is necessary to have site-specific plans. As demonstrated in the Field Study, use in vineyards varied from 1 to 3-4 inches depending on the location and soil type. Therefore, in order for the public to be assured that treated wastewater is not applied in excess of agronomic rates, such site-specific technical studies are necessary and should be required prior to any long-term use.

3. HEALDSBURG'S APRIL 2014 ADDENDUM TO THE 2005 FEIR IS INACCURATE AND INADEQUATE FOR CEQA ANALYSIS

Healdsburg's 2014 Addendum to its 2005 FEIR should not be considered adequate CEQA analysis for potential expansion of vineyard wastewater irrigation beyond the geography considered in the 2005 FEIR and the 2009 Mitigated Negative Declaration. And, provided there is site specific analysis and monitoring as discussed above in the areas covered in the certified documents.

The Addendum totally disregards major differences in geology and hydrology between the Middle Reach and the Dry Creek or Alexander valleys. Thus, we assume that the time pressures for short-term drought relief resulted in the NCRWQCB staff's May 6, 2014 letter to Healdsburg concurring with the determinations in this Addendum.

It also totally disregards significant new information available since 2005. For example, the Addendum, page 2, claims that the additional areas covered by the proposal are essentially identical in character to the areas covered in the 2005 FEIR because the USDA Soil Survey indicates consistent soil conditions. To then assume drainage characteristics will also be consistent is clearly a gross generalization that totally ignores other geological differences and most importantly major hydrological and water balances differences among the various areas.

The Addendum, page 15, states that there is no new information before Healdsburg regarding the project that was not known at the time the 2005 FEIR was certified. This statement disregards the extensive work of Johnson and Yates in the Dry Creek and Alexander Valleys, published in 2008 and 2009 and submitted into the City of Healdsburg record commenting on the Mitigated Negative Declaration for the Syar Irrigation Project. It also disregards the conclusions of the Yates September 21, 2012 letter to Healdsburg, and the Field Study which are included in Appendix A of the Walker Technical Report.

The Johnson and Yates reports clearly point out major differences in the geology and hydrology of the Alexander and Dry Creek valleys versus that in the Middle Reach, and also show hydrologic differences between the upper and lower portions of the Middle Reach. These reports provide considerable evidence that the Dry Creek and Alexander valleys are more susceptible to surface water contamination from vineyard irrigation with wastewater.

The Yates September 21, 2010 letter has an entire section describing the major hydraulic, water balance, and surface water/ groundwater interaction differences

between the Dry Creek Valley and the Middle Reach. And, the Yates letter, contracted by Healdsburg, assumed irrigation rate of 6 in/acre/year was based on undocumented verbal information. The Yates letter states "My recent evaluation of the Syar vineyard project considered only conditions at that site. The types of impacts evaluated were the same ones covered in a prior evaluation of the Northern Sonoma County Agricultural Reuse Project, but the conclusions were different for all of the impacts."

The references to demonstrate the differences among various areas are all in the City's records. Healdsburg's assertion that the there is no new information in certifying the Addendum for expansion wastewater irrigation areas also completely ignores the information provided in the Field Study. This study, done in 2012, was included in the Appendix to the Walker Technical Study, and in 2013 the CWC and Mark Greenspan briefed Healdsburg officials on the methodology and conclusions, thus, Healdsburg knew the results prior to certifying the Addendum.

The Field Study clearly demonstrates the required timing for irrigation based on soil moisture with actual hydraulic agronomic rates significantly lower than those used in the previous studies based on theoretical models, not field measurements. The Field Study, which the Water Board encouraged the Westside Association to Save Agriculture (WASA) to complete, provides actual field data that challenges some of the conclusions of the earlier documents.

Clearly, Healdsburg's assertion that it has no new information pertinent to its environmental review of the irrigation project is simply incorrect. And, to conclude that moving a million gallons per day of recycled water to vineyard irrigation from the 2005 FEIR Middle Reach Area to areas in Dry Creek or Alexander valleys will have no potential to create new or more severe impacts is inaccurate.

The Addendum's conclusions are clearly inadequate and incorrect and it cannot make the findings necessary to certify its compliance with CEQA. Findings can only be made once Healdsburg conducts hydrologic studies in each valley considered for use of treated wastewater.

4. PROVISIONS OF THE TWO-YEAR SAMPLE RECYCLED WATER USER AGREEMENTS SHOULD NOT SET A PRECEDENT FOR FUTURE, LONGER TERM USER AGREEMENTS

The authorization to provide treated wastewater during the 2014 and 2015 irrigation seasons was given in response to the General Order for emergency drought relief, and was not subject to normal public review and comment protocols. While it may have been necessary to initiate deliveries of wastewater to alleviate the impacts of the severe drought conditions on farmers in the short-term, this flawed FEIR, MND and Addendum should not be considered as meeting CEQA requirements for approval of long-term irrigation plans.

As pointed out in this letter and in previous correspondence to the NCRWQCB and Healdsburg, the CWC believes there are serious deficiencies in these documents and the public should have a right to review and comment on such documents prior to any NCRWQCB action regarding use of treated wastewater beyond the 2014 and 2015 irrigation seasons as a response to severe drought conditions in California.

Since the NCRWQCB has now granted Healdsburg a 5-year extension of time to meet the requirements of Cease and Desist Order R1-2010-0034, there is no reason for the short-term arrangement to be the basis for long-term wastewater delivery to comply with the Order. For the longer-term use, such time pressures do not exist, and we request that the NCRWQCB engage in its normal processes and procedures for consideration of such impactful decisions.

The provision of treated wastewater under the short-term User Agreements should terminate when the General Order is rescinded or the end of the 2015 irrigation season, whichever occurs first.

For the reasons stated above, the CWC respectfully requests that wastewater drip irrigation not be commenced under any long-term authorization or User Agreement under Order No.R1-2010-0034 until the above issues, errors and deficiencies as well as issues and deficiencies raised in the CWC's previous letters have been addressed.

Thank you considering both these comments and the findings of the October 2014 Technical Report; and we look forward to pro-actively working with Healdsburg and the NCRWQCB on this matter.

Sincerely,

Judith Olney
Chair, Clean Water Coalition of Northern Sonoma County

CC: Catherine Goodwin, North Coast Regional Water Quality Control Board

Terry Crowley, City of Healdsburg Department of Public Works

Addendum and Attachment titled: Response to Walker Report entitled "Programmatic Operations and Management Technical Report for Micro-Irrigation of Vineyards in the Healdsburg Area"

Addendum to CWC Letter: Reports and Technical Analyses incorporated by Reference and previously submitted into Healdsburg's and/or NCRWQCB Records

1. *Response to Walker Report entitled "Programmatic Operation and Management Technical Report for Micro-Irrigation on Vineyards in the Healdsburg Area"* Mark Greenspan, PhD, CPAg, CCA dated October 8, 2014. (Attached)

2. *2012 Middle Reach Russian River Vineyard Irrigation Demonstration Project*, Mark Greenspan, PhD, CPAg, CCA for Syar Industries and the Westside Association to Save Agriculture, dated February 8, 2013.

3. *Impacts of Recycled Water Irrigation on Groundwater and Surface Water Flow and Quality near Healdsburg: a Generalized Approach*, Gus Yates for Healdsburg, dated September 21, 2010

4. *Syar Property Recycled Wastewater Agricultural Irrigation Project (NSCARP) – Additional Analysis of Potential Groundwater and Russian River Impacts*, Gus Yates for Healdsburg, dated June 28, 2010

5. *Northern Sonoma County Agricultural Reuse Project, FEIR: Technical Review of Hydrology and Water Quality Issues, with Technical Memorandum dated March 9, 2009 reviewing Johnson 2008 Dry Creek Valley report and revising Johnson's Water and Salt Balance Tables*, Gus Yates for CWC, dated April 22, 2009

6. *Potential Water Supply Impacts to Dry Creek Valley from NSCARP and a Bypass Pipeline*, N.M. Johnson for Dry Creek Valley Association, dated December 2008

7. *Potential Water Quality Impacts of NSCARP in the Alexander Valley*, N.M. Johnson for the Alexander Valley Association and the SRNA, dated May 2007