CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

BOARD ORDER NO. R6V-2004-0005-A1
WDID NO. 6B360703001

AMENDMENT TO WASTE DISCHARGE AND WATER RECYCLING REQUIREMENTS

FOR

FORT IRWIN NATIONAL TRAINING CENTER WASTEWATER TREATMENT FACILITY

San Bernardino County

The California Regional Water Quality Control Board, Lahontan Region (Water Board) finds:

1. Discharger

The Wastewater Treatment Facility (WTF) for the U. S. Army Fort Irwin National Training Center (NTC) is owned and operated by CH2M Hill. The U.S. Department of the Army owns the land where the facility is located and where discharges occur. CH2M Hill and the U. S. Department of the Army are collectively referred to as the "Discharger" for the purpose of this Water Board Order (Order). The Discharger has proposed in the Report of Waste Discharge submitted August 8, 2012, to: (1) construct an auxiliary percolation pond (Pond No. 4) and discharge treated effluent to it as an authorized disposal site and (2) repair Pond No. 3. No changes in effluent flow or quality are proposed.

2. Facility

The NTC WTF and associated disposal facilities are referred to as the "Facility" for the purpose of this Order.

3. Order History

The Water Board previously established revised Waste Discharge Requirements (WDRs) for the Facility under Board Order No. R6V-2004-0005 adopted on February 10, 2004.

The Water Board issued Investigative Order No. R6V-2010-0030, dated September 30, 2010, requiring the Discharger to provide technical reports containing the following information: (1) the extent and characteristics of the existing groundwater pollution and degradation associated with past and current wastewater treatment and disposal practices at the Fort Irwin Wastewater

Treatment Facility; (2) the history of Facility upgrades since February 2004; (3) the manner in which the full horizontal and vertical extent of the groundwater pollution and degradation caused by past and current wastewater treatment and disposal practices will be investigated; and (4) the results of the groundwater investigation. The results of the investigation will be used to develop a feasibility study of alternatives to achieve complete groundwater cleanup in accordance with State Water Resources Control Board Resolution No. 92-49, and for returning the Discharger to compliance with the waste discharge requirements specified by Board Order No. R6V-2004-0005.

4. Reason for Action

The Water Board is amending Board Order No. R6V-2004-0005 for the following reasons:

a. Change in Discharger

The NTC WTF is now owned and operated by CH2M Hill. The Facility ownership was transferred from the U.S. Army to CH2M Hill on June 14, 2005, as part of the Fort Irwin utilities privatization. A Board Order Transfer Form was submitted requesting transfer of WDRs and was accepted on February 9, 2006. Although the facility assets were transferred, the U.S. Army retained ownership of the land. This Order documents the change of Discharger designated in the WDRs to both CH2M Hill and the U.S. Department of the Army, Fort Irwin NTC.

b. Modification of Existing and Proposed Treatment and Disposal Facilities

Table 1 of Board Order No. R6V-2004-005 lists the Facility unit processes and the status of each as either existing or proposed. Table 1 has been updated to reflect current conditions and is provided in Attachment A. The list of unit processes in Attachment "A" refers to a Site Map and a Recycled Water Use Area Map (Attachments "B" and "C," respectively). These maps have been updated since Board Order No. R6V-2004-005 was adopted. Therefore, Attachments "B" and "C" of Board Order No. R6V-2004-005 are replaced with Attachments "B" and "C" of this Order, respectively.

c. Modification of Authorized Disposal Sites and Recycled Water Use Areas

Disposal Sites

The existing percolation ponds for the treated effluent disposal system require maintenance and repair that cannot be adequately conducted while the existing ponds are in service. In particular, the berm of Pond No. 3 is in need

of repair. A redundant percolation pond is needed to allow any existing percolation pond to be taken out of service for proper maintenance and repair. Provision 6 of the Standard Provisions for WDRs (Attachment G of Board Order No. R6V-2004-0005) is entitled "Proper Operation and Maintenance" (hereafter referred to as "Provision 6"). Provision 6 requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the WDRs. Pursuant to Provision 6, the Discharger has proposed to construct an additional percolation pond that would allow other ponds to be taken out of service for proper maintenance and repair. This Order authorizes the discharge of treated effluent to the additional disposal site designated as "Proposed Pond 4" as shown in Attachment "B."

Recycled Water Use Areas

This Order also authorizes six additional Recycled Water Use Areas proposed by the Discharger to be added to the 14 areas authorized by Board Order No. R6V-2004-005. Discharge to these areas must comply with the Reclamation Requirements listed in Section II (pp. 9 - 10) of Board Order No. R6V-2004-0005. Discharge to the proposed Recycled Water Use Areas may begin after the Discharger submits an amended Engineering Report approved by Department of Health Services. The existing and currently proposed Recycled Water Use Areas are shown in Attachment "C." Additional Recycled Water Use Areas may be added in the future without the need to amend these revised waste discharge and water recycling requirements provided that recycled water use does not exceed 1 million gallons per day and the Reclamation Requirements listed in Board Order No. R6V-2004-005 are met. These requirements include submittal of an amended Engineering Report describing how the Facility meets recycled water effluent limits and complies with the Department of Health Services criteria.

d. Oxidation Ditch

The existing oxidation ditch used for biological wastewater treatment has experienced difficulties in achieving enough nitrification and denitrification in the wastewater to adequately remove nitrogen. During five months in 2010, monthly nitrate nitrogen concentrations in the effluent ranged from 10 to 18 milligrams per liter (mg/L). During five months in 2011 and 2012, monthly ammonia nitrogen concentrations in the effluent ranged from 12 to 32 mg/L. Organic and ammonia nitrogen (i.e., Total Kjehldahl Nitrogen or "TKN") readily convert to nitrite nitrogen and then nitrate nitrogen under oxidizing conditions. Discharge of the combined concentrations of nitrogen species that readily convert to nitrate nitrogen must comply with water quality objectives, prohibitions, and policies described in the *Water Quality Control Plan for the Lahontan Region* (Basin Plan) including protection of the

receiving water to meet the water quality objective for the beneficial use of municipal supply water (nitrate nitrogen at or below the maximum contaminant level of 10 mg/L) and the Antidegradation Policy.

Given the past and current impacts to the receiving water because of nitrate pollution, this Order requires the discharger to make the necessary improvements to the treatment processes, including the oxidation ditch so that the treatment plant can be operated in a manner that achieves improved nitrogen removal in compliance with the Basin Plan.

e. Auxiliary Oxidation Ditch

The NTC WTF does not currently have an auxiliary biological treatment system (e.g., oxidation ditch) or other equivalent treatment system as backup. An auxiliary oxidation ditch, or equivalent treatment system, is necessary to take the one existing oxidation ditch out of service for maintenance, repair, or upgrade. Provision 6 requires the operation of backup or auxiliary facilities or similar systems that are installed by the Discharger, when necessary to achieve compliance with the conditions of the WDRs. This Order requires the Discharger to construct an additional oxidation ditch or equivalent treatment system that will allow the existing oxidation ditch to be taken out of service for maintenance, repair, or upgrade.

f. Amendment of Monitoring and Reporting Program No. R6V-2004-0005.

Monitoring and Reporting Program No. R6V-2004-0005 requires that: (1) effluent is monitored for ammonia and nitrate, (2) the vadose zone monitoring locations are monitored for nitrate, and (3) groundwater monitoring wells are monitored for nitrate. TKN and nitrite nitrogen can be readily converted to nitrate nitrogen as a reaction product under oxidizing conditions. Therefore, it is important to monitor TKN and nitrite nitrogen as well as nitrate nitrogen when monitoring the effluent, groundwater and vadoze zone.

Monitoring and Reporting Program No. R6V-2004-0005-A1, Attachment "D," requires the Discharger to monitor TKN and nitrite nitrogen in addition to the monitoring parameters required for effluent, groundwater, and the vadose zone in Monitoring and Reporting Program R6V-2004-0005.

g. State Water Board Recycled Water Policy

State Water Board Resolution No. 2009-0011, "Adoption of a Policy for Water Quality Control for Recycled Water," references and adopts the "State Water Resources Control Board Recycled Water Policy" (Recycled Water Policy). The Recycled Water Policy provides direction to the State and Regional

Water Boards regarding issuing permits for recycled water projects. This Order implements the Recycled Water Policy.

This Order requires the Discharger to develop a Salt and Nutrient Management Plan for the Irwin Basin that is consistent with Paragraph 6 of the Recycled Water Policy. The Recycled Water Policy requires that Salt and Nutrient Management Plans are completed and proposed to the Water Board within five years of the date of the policy unless the Water Board finds that the stakeholders are making progress towards completion of a plan and in no case shall the period for the completion of a plan exceed seven years. The Water Board finds that the Discharger has made progress by planning and implementing tertiary treatment upgrades to the wastewater treatment plant to enable recycling of wastewater. Planning for recycled water use contributes to the overall planning process. The Discharger continues to make progress by planning and seeking funding for a denitrification upgrade to the wastewater treatment system. The Discharger is also making progress by coordinating with Water Board staff and by seeking funding to complete the Salt and Nutrient Management Plan within the required time limit. This Order requires the plan to be completed by November 15, 2015. Completion by this date complies with the Recycled Water Policy requirement that Salt and Nutrient Management Plans are completed within seven years of the date of the policy (February 3, 2009).

5. California Environmental Quality Act

The purpose of the proposed project is to provide proper operation and maintenance of existing facilities that dispose of treated effluent from domestic wastewater (i.e. sewage). The project consists of repair of Pond No. 3 and construction of an auxiliary percolation pond (Pond No. 4) and minor modifications of the existing wastewater treatment plant.

These activities are exempt from CEQA under section 15301 of the CEQA Guidelines because they consist of "the operation, maintenance, permitting ... or minor alteration of existing public ... structures, facilities, mechanical equipment ... involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination." The project will not result in any increase in the quantity of the discharge, but rather allow the existing facilities to work more effectively and provide redundancy.

6. Antidegradation Policy

State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," states,

"1. Whenever the existing quality of water is better than the quality established in policies as of the date on which such policies become effective, such existing high quality will be maintained until it has been demonstrated to the State that a change will be consistent with the maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial use of such water and will not result in water quality less than that prescribed in the policies.

2. Any activity which produces or may produce a waste...and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) pollution or nuisance will not occur, and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."

Degradation of water quality from the discharge of treated wastewater from the treatment plant is evaluated in Board Order No. R6V-2004-0005. Implementation of the proposed project to construct Pond No. 4 and repair of Pond No. 3 will not change the quality or the quantity of the discharge or the treatment capacity of the Facility. Discharge of treated effluent to the alternative authorized disposal site at Pond No. 4, adjacent to existing authorized disposal sites, will only occur when Pond No. 3, or one of the other ponds, is out of service, and will, therefore, have negligible or no effect on groundwater quality. Implementation of the proposed project will result in an auxiliary disposal pond that is necessary for proper operation and maintenance of the Facility and to reduce the risk of unauthorized discharges and associated threats to public health and safety. Modification of the oxidation ditch to achieve a discharge in compliance with water quality objectives, prohibitions, and policies, will improve water quality over current conditions. Construction of an auxiliary oxidation ditch will not cause water quality degradation because the ditch will be constructed with concrete to minimize leakage. None of the actions required by this Order to modify the existing oxidation ditch or construction of an auxiliary oxidation ditch will cause water quality degradation.

The Water Board has considered antidegradation policies and finds that the subject discharge of treated effluent to land is consistent with provisions of these policies and is in the best interest of the people of the State of California.

This Order is consistent with Resolution No. 68-16 for the following reasons:

a. One purpose of this project is to improve physical conditions of the facility to substantially reduce the risks associated with unauthorized discharges of undisinfected effluent due to failures of pond structural integrity. The benefit to water quality is the reduction or elimination of potential impacts to water quality associated with unauthorized discharges. There will be negligible

degradation of groundwater quality associated with the additional disposal site because it will only be used when the one of the current ponds is out of service and will not result in any change in either the quality or the quantity of discharge.

The discharger has also proposed to modify the existing oxidation ditch to achieve a discharge that is in compliance with water quality objectives, prohibitions, and policies by the construction of an auxiliary oxidation ditch to allow proper operation and maintenance of the treatment systems. It is understood that the Discharger will allocate time between the two systems to optimize the quality of the effluent and maintain the longevity and readiness of both systems. None of the actions to modify, upgrade, or add an oxidation ditch will result in reducing the quality or increasing in the quantity of the discharge, and therefore, degradation of water quality will not occur. These actions are, therefore, consistent with Resolution No. 68-16.

b. Board Order R6V-2004-0005 prohibits the discharge of treated water that causes a pollution or nuisance, and this amendment does not change that requirement. The discharger has proposed to operate the plant in a manner such that the discharge complies with the existing Board Order and this Amendment.

c. The discharge of treated effluent to the additional disposal site is protective of current and potential beneficial uses of the receiving water. The modification of the existing oxidation ditch and the addition of an auxiliary oxidation ditch is protective of current and potential beneficial uses of the receiving water.

7. Consideration of Water Code Section 13241 Factors

California Water Code (CWC) Section 13241 requires that the Water Board, when prescribing WDRs, take into consideration these factors:

a. Past, Present, and Probable Future Beneficial Uses of Water – The receiving waters are the groundwaters of the Irwin Basin (6-36.02) of the Langford Hydrologic Subarea (628.73) of the Afton Hydrologic Area of the Mojave Hydrologic Unit. The beneficial uses of the groundwater are described in Finding No. 19 of Board Order R6V-2004-0005 as:

- MUN - municipal and domestic supply
- AGR - agricultural supply
- IND - industrial service
- FRSH - freshwater replenishment

The receiving water limits are described in Discharge Specification I.B. of Board Order No, R6V-2004-0005. The limits are specified to maintain the beneficial uses listed above.

b. Environmental Characteristics of the Hydrographic Unit Under Consideration, Including the Quality of Water Available Thereto – Hydrogeologic characteristics of the discharge area in the Mojave Hydrologic Unit is described in Finding No. 12 of Board Order No. R6V-2004-0005. Groundwater beneath Fort Irwin occurs in a generally closed basin with little inflow or outflow. Groundwater levels near the supply wells in the Fort Irwin basin have been lowered due to groundwater pumping for the beneficial use of municipal water supply. Groundwater beneath the wastewater treatment plant has formed a mound due to recharge by treated effluent. Overall, there has been a slight increase in groundwater elevations due to recharge with water imported into the basin.

For most constituents, the groundwater quality is sufficient to support the designated beneficial use of municipal water supply. However, the naturally occurring concentrations of arsenic and fluoride in groundwater average 14 µg/L and 5 mg/L, respectively and are greater than the maximum contaminant levels allowed in drinking water (10 µg/L and 2 mg/L, respectively). The natural groundwater is suitable for MUN supply with treatment or blending.

c. Water Quality Conditions that Could Reasonably Be Achieved through the Coordinated Control of All Factors, Which Affect Water Quality in the Area – Groundwater quality at the discharge area can be improved and sustained for the long term by the coordinated control of water supply treatment and wastewater treatment, disposal, and recycling. Groundwater is currently naturally degraded with respect to fluoride and arsenic and degraded with respect to TDS, nitrate nitrogen, and trihalomethanes (THMs) due to past discharges. Groundwater quality can improve for these constituents by controlling the factors that affect water quality as described below.

A new treatment facility for Fort Irwin supply water is currently expected to be operational in 2015. Water supply treatment is not required pursuant to Water Board authority. However, since the facility is expected to be built, it is reasonable to acknowledge the anticipated benefits to water quality that may materialize when the facility is constructed and placed into operation. The new water treatment plant is expected to reduce concentrations of arsenic and fluoride in supply water to 7.5 µg/L and 1.3 mg/L, respectively. The arsenic and fluoride concentrations in wastewater and treated effluent are expected to decrease accordingly. Infiltration of treated effluent is therefore expected to improve groundwater quality with respect to arsenic and fluoride when the new water supply treatment system begins operation.

Bench-scale test results indicate that the new water supply treatment system can reduce TDS concentrations to below recommended levels for drinking water (i.e., 500 mg/L) and well below background concentrations (approximately 600 mg/L). Effluent concentrations for TDS are expected to remain less than background concentrations. Infiltration of treated effluent is

therefore expected to improve groundwater quality with respect to TDS when the new water supply treatment system begins operation.

Biological wastewater treatment systems that are designed and operated for nitrification and denitrification are capable of removing enough total nitrogen from wastewater to meet or exceed water quality objectives for nitrate nitrogen. Pursuant to waste discharge requirements, the Discharger is required to make the design and operational improvements to the wastewater treatment system that are necessary to comply with water quality objectives, prohibitions, and policies in the Basin Plan. Groundwater quality will begin to improve with respect to nitrate nitrogen when the improvements to nitrification and denitrification in the wastewater treatment system are implemented.

The plume of trihalomethane beneath the Facility appears to be shrinking because of improvements to the treatment system already implemented by the Discharger. By ceasing to chlorinate the portion of the discharge directed to disposal, trihalomethanes have been eliminated from the discharge to the percolation ponds and groundwater quality is currently improving with respect to trihalomethanes.

The Discharger plans to begin using recycled water in more landscape areas that are currently irrigated with supply water pumped from groundwater. Including more areas for recycled water use will not only decrease demands for pumping groundwater, it will reduce the amount of effluent discharged to the percolation ponds and allow water to be beneficially used. Reducing the amount of effluent discharged will also reduce the magnitude and mobilization of the constituents of concern already present in the groundwater.

It is possible that groundwater quality could be improved by selecting alternative locations for infiltration that do not percolate effluent through sediments where naturally occurring salts could be leached (i.e., salty geologic formations such as evaporites) or where constituents are elevated in soils because of past discharges. With the improvements to water supply and wastewater treatment systems scheduled to occur with the next few years, there will be an opportunity to discharge treated effluent in a manner that improves water quality. Any actions to reduce the groundwater mound beneath the Facility which is coincident with the contaminant plume will also serve to stop mobilizing contaminants which may cause additional water quality degradation downgradient of the current contaminant plume.

The development and implementation of a Salt and Nutrient Management Plan will provide a mechanism to coordinate and control the factors that affect water quality with respect to salts and nutrients. Implementation of the Salt and Nutrient Management Plan can contribute to the restoration of groundwater quality that has been degraded by past discharges.

d. Economic Considerations – This Order authorizes an additional disposal site necessary for the proper operation and maintenance of the Facility, the modification of the existing oxidation ditch to maintain compliance with receiving water limits, and construction of an auxiliary oxidation ditch, or equivalent treatment system, to provide redundancy in the event the oxidation ditch must be taken out of service for repair or maintenance. The cost of the proposed project is warranted considering the potential liability for not properly operating and maintaining the Facility and threats to public health and safety if the existing ponds and oxidation ditch must be taken out of service for repair or maintenance.

e. The Need to Develop and Use Recycled Water – The Facility has implemented a recycled water program and recycles as much as practicable, which is currently approximately 300,000 gallons per day in summer and 100,000 gallons per day in winter. The Discharger plans to increase the number of landscape areas irrigated with recycled water. The Facility infiltrates treated effluent in excess of the quantity recycled to provide recharge to underlying groundwater.

8. California Code of Regulations Title 27 Exemption

Pursuant to CCR, Title 27, section 20090, the discharge of domestic sewage or treated wastewater associated with municipal wastewater treatment plants is exempt from the SWRCB-promulgated provisions of Title 27, providing the discharge meets all of the conditions listed below.

"Wastewater -Discharges of wastewater to land, including but not limited to evaporation ponds, percolation ponds, or subsurface leach fields if the following conditions are met:

(1) The applicable RWQCB [Water Board] has issued WDRs, reclamation requirements, or waived such issuance;
(2) The discharge is in compliance with the applicable water quality control plan (Basin Plan); and
(3) The wastewater does not need to be managed according to Chapter 11, Division 4.5, Title 22 of this code as a hazardous waste."

The discharge of wastewater that is the subject of this Order meets the conditions for Title 27 exemption:

(1) The discharge of wastewater is regulated by the WDRs in Board Order R6V-2004-0005 and this Order.

(2) The discharge of treated wastewater to land authorized by this Order is in compliance with Basin Plan requirements including water quality

objectives, prohibitions, and the antidegradation policy. Groundwater beneath the Proposed Pond No. 4 currently meets water quality objectives. The authorized discharge is protective of the beneficial uses of the receiving water. Therefore, the discharge is in compliance with the Basin Plan.

(3) The discharge is not required to be managed as a hazardous waste because sample data have shown that the waste characteristics do not meet criteria for classification as a hazardous waste.

9. Notification of Interested Parties

The Water Board has notified the Discharger and interested parties of its intent to amend the WDRs for the discharge.

10. Consideration of Public Comments

The Water Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED that the Discharger shall comply with the following:

I. Finding No. 1 of Board Order No. R6V-2004-0005 is replaced as follows:

The Discharger shall be designated as defined in Finding No. 1 of this Order.

II. Board Order No. R6V-2005-005 includes Table 1 – "Fort Irwin WTF Unit Processes" and Attachments "B" and "C" entitled "Fort Irwin Wastewater Treatment Plant Site Plan" and "Fort Irwin Tertiary Upgrade Potential Reclaimed Water Users," respectively. Table 1 and Attachments "B" and "C" of Board Order No. R6V-2004-0005 are replaced with Table 1 in Attachment "A" and Attachments "B" and "C" of this Order, respectively.

III. Finding No. 9 of Board Order R6V-2004-0005 is amended by adding the following:

"Treated undisinfected secondary wastewater may be disposed to Pond 4, as described in Finding No. 4.c., Table 1, and Attachment "B" of this Order. Disinfected tertiary recycled water may be used as described in Finding 4.c. of this Order.

IV. Monitoring and Reporting

Pursuant to CWC section 13267(b), the Discharger shall comply with Monitoring and Reporting Program No. R6V-2004-0005A1 as specified by the Executive Officer.

V. Time Schedule

A. Pursuant to CWC Section 13267(b), the Discharger shall comply with the following:

1. Submit a work plan and schedule by **January 15, 2013** for the repair of Pond 3 and the construction of an auxiliary disposal pond (Pond No. 4) as described in Finding No. 4.c. of this Order. The plan must be certified by a Civil Engineer registered in California.

2. Submit a work plan and schedule by **March 15, 2014** for the modification of the existing oxidation ditch, or equivalent treatment system, to comply with Basin Plan water quality objectives, prohibitions, and policies as described in Finding No. 4.d. of this Order.

3. Submit a work plan and schedule by **March 15, 2014** for the construction of an auxiliary oxidation ditch, or equivalent treatment system, as described in Finding No. 4.e. of this Order. The plan and pond design must be certified by a Civil Engineer registered in California.

B. Upon work plan approval, the Discharger shall comply with the following:

1. Complete the construction of Pond No. 4 and repair of Pond No. 3, as described in Finding No. 4.c. of this Order, by **November 15, 2013**. Submit final design and as-built drawings certified by a Civil Engineer registered in California within 120 days after pond completion.

2. Complete the construction of an auxiliary oxidation ditch, or equivalent treatment system, and modify the existing oxidation ditch as described in Finding No. 4.e. and Finding No. 4.d., respectively, by **November 15, 2017**.

C. In accordance with the Recycled Water Policy:

1. The Discharger must develop and/or participate in the development of a Salt and Nutrient Management Plan for the Irwin Basin that is consistent with Paragraph 6 of the Recycled Water Policy and Finding 4.g. of this Order. A draft Salt and Nutrient Management Plan must be submitted to Lahontan Water Board staff by **November 15, 2014**. An approved Salt and Nutrient Management Plan must be submitted to the Lahontan Water Board by **November 15, 2015**.

VI. All Findings, Specifications, and Provisions contained in Board Order No. R6V-2004-0005 not amended by this Order remains in effect.

I, Patty Z. Kouyoumdjian, Executive Officer, do hereby certify that the forgoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Lahontan Region, on November 14, 2012.

Patty Z. Kouyoumdjian

PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

Attachment: A. Table 1 - Fort Irwin WTF Unit Processes
B. Site Map
C. Recycled Water Use Area Map
D. MRP No. R6V-2004-0005-A1

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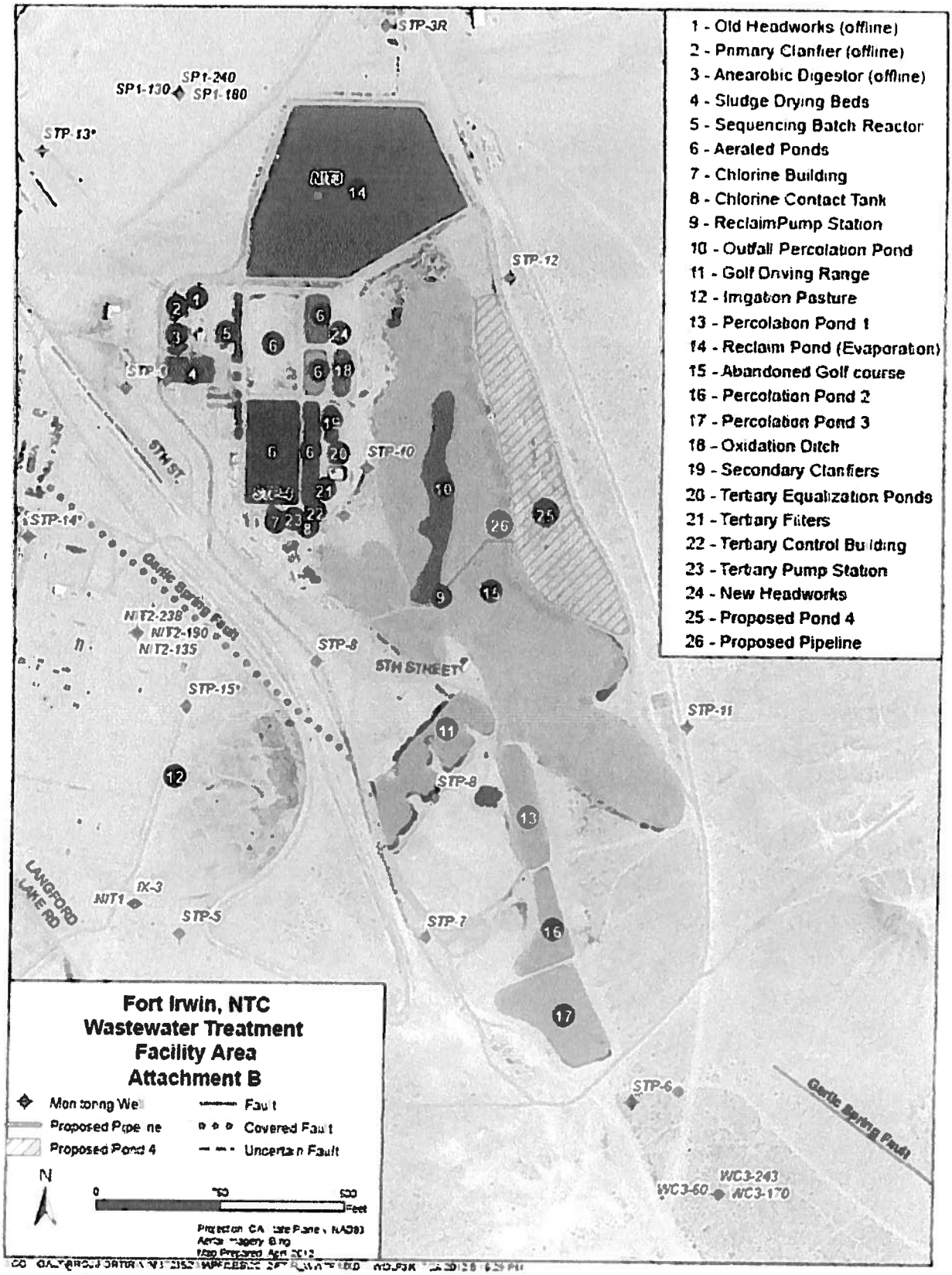
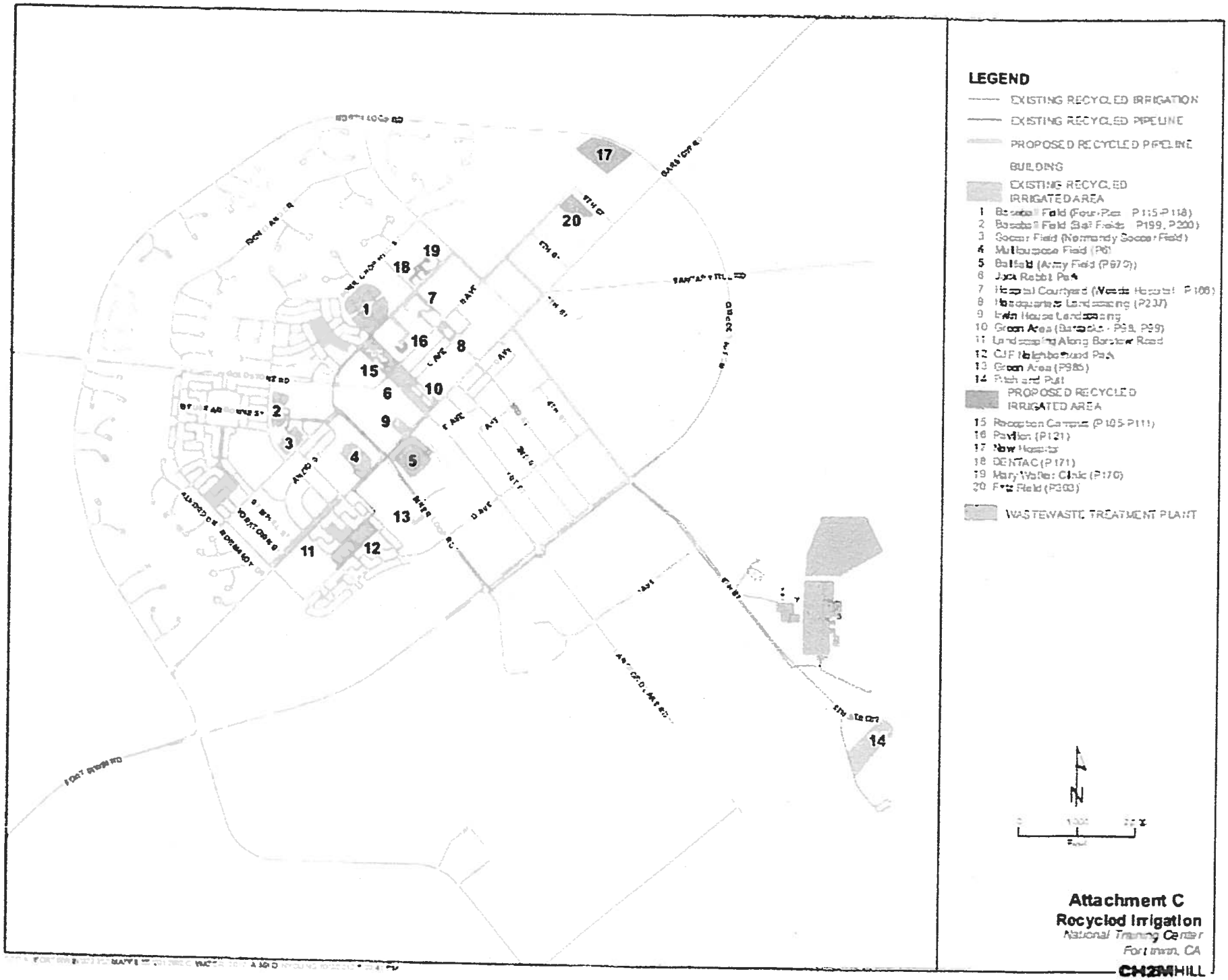
Table 1 – Ft. Irwin WTF Unit Processes

Unit Process Description	Existing (E) Proposed (P)	#No. Units	Comments
Collection System	E	N/A	24-inch PVC (installed in 2008) influent line
Septage Pretreatment	E	3 ea	Sequence Batch Reactors were to provide a septage pretreatment station for use when it is necessary to prevent "shock" loading of the biomass system. Studies have indicated this system was not necessary. Currently not in service.
Headworks – Parshall flume, manual bar screen, fine screen and fine screen washer compactor, grit chamber, grit cyclone and grit classifier.	E	1 ea	Installed in 2008. Screenings and grit are dewatered and disposed in the Ft. Irwin Sanitary landfill. The design of the headworks accommodates an additional grit separating equipment (chamber, cyclone and classifier).
Secondary – Oxidation Ditch	E, P	2 ea	Aerobic biological secondary treatment systems. One oxidation ditch exists and an additional oxidation ditch is proposed.
Secondary - Anoxic Reactor	P	2 ea	The proposed anoxic reactor units are located upstream of the oxidation ditch(es). RAS, and mixed liquor are mixed with influent from the preliminary treatment process and the effluent from the reactors is conveyed to the oxidation ditch(es).
Secondary – Clarifiers	E	2 ea	Return Activated Sludge (RAS) is sent to the oxidation ditch and Waste Activated Sludge (WAS) is sent to the drying beds.
Flow Equalization Basins	E	2 ea	Secondary effluent flow equalization basins have been lined with a 36-mil polypropylene synthetic material to prevent percolation of untreated wastewater to ground water and used to regulate flow to the new tertiary treatment system.
Flocculation Tank	E	1 ea	Secondary effluent is pumped to this basin where coagulant is added and mixed, prior to filtration.
Filters	E	2 ea	Cloth filter systems for filtering effluent prior to discharge.
Chlorine Contact Chamber	E	1 ea	Sodium hypochlorite is used to disinfect the filtered effluent before delivery to recycled water use areas.
Recycled Water Pump Station	E, P	1 ea	The pump station provides pressurized recycled water for distribution through the recycled water pipeline to recycled water use areas. Station has four pumps (3@200 HP, and 1@150HP), and has room for two additional pumps.
Recycled Water Pipeline	E, P	1 ea	The existing main delivery pipeline is planned to be extended to proposed recycle water use locations.
Recycled Water Use Areas	E, P	20 ea	14 recycled water use areas currently exist. 6 more areas are currently planned for connection to the distribution system as shown in Attachment "C". Additional landscape irrigation areas, beyond the 20 listed in Attachment "C," are intended to be proposed in the future. Up to 1 mgd is planned for recycle use.
Aerated Oxidation Ponds	E	5 ea	For emergency use only and during the oxidation ditch aerator upgrade. Each pond has an 18-inch clay liner.

Sludge Drying Beds	E	24 ea	Combination of impervious (concrete) and sand type dryings beds. All drying bed drains collect water for return to the headworks. The sand beds have a 60 mil polyvinyl chloride (PVC) liner.
Outfall Percolation Pond	E	1 ea	This 3-acre unlined pond holds treated effluent.
Evaporation Pond	E	1 ea	Effluent is discharged to the Outfall Percolation Pond and subsequently conveyed to the 22 acre clay lined evaporation pond. The evaporation pond location is shown in Attachment "B."
Percolation Ponds	E, P	4 ea	Effluent is discharged to the Outfall Percolation Pond and subsequently conveyed to Percolation Ponds 1, 2, 3, and 4 (Proposed Pond 4). All percolation pond locations are shown in Attachment "B."


1 - Old Headworks (offline)
2 - Primary Clarifier (offline)
3 - Anearobic Digestor (offline)
4 - Sludge Drying Beds
5 - Sequencing Batch Reactor
6 - Aerated Ponds
7 - Chlorine Building
8 - Chlorine Contact Tank
9 - ReclaimPump Station
10 - Outfall Percolation Pond
11 - Golf Driving Range
12 - Irrigation Pasture
13 - Percolation Pond 1
14 - Reclaim Pond (Evaporation)
15 - Abandoned Golf course
16 - Percolation Pond 2
17 - Percolation Pond 3
18 - Oxidation Ditch
19 - Secondary Clarifiers
20 - Tertiary Equalization Ponds
21 - Tertiary Filters
22 - Tertiary Control Building
23 - Tertiary Pump Station
24 - New Headworks
25 - Proposed Pond 4
26 - Proposed Pipeline
STP-3R
SP1-240
SP1-130
SP1-180
STP-13
STP-12
STP-3
STP-10
STP-14
5TH ST.
Garlic Spring Fault
NIT2-238
NIT2-190
NIT2-135
STP-8
5TH STREET
STP-15
STP-11
STP-9
LANGFORD LAKE RD
IX-3
NIT1
STP-5
STP-7
STP-6
WC3-243
WC3-60
WC3-170
Fort Irwin, NTC
Wastewater Treatment
Facility Area
Attachment B
Monitoring Well
Proposed Pipeline
Proposed Pond 4
Fault
Covered Fault
Uncertain Fault
N
0
500
Feet


LEGEND
EXISTING RECYCLED IRRIGATION
EXISTING RECYCLED PIPELINE
PROPOSED RECYCLED PIPELINE
BUILDING
EXISTING RECYCLED IRRIGATED AREA
1 Baseball Field (Four-Plex P115-P118)
2 Baseball Field (Ball Fields P199, P200)
3 Soccer Field (Normandy Soccer Field)
4 Multipurpose Field (P6)
5 Ballfield (Army Field (P870))
6 Joint Rabbit Park
7 Hospital Courtyard (Weeks Hospital P106)
8 Headquarters Landscaping (P237)
9 Irwin House Landscaping
10 Green Area (Barracks P99, P99)
11 Landscaping Along Barstow Road
12 CDF Neighborhood Park
13 Green Area (P985)
14 Pitch and Putt
PROPOSED RECYCLED IRRIGATED AREA
15 Reception Campus (P105-P111)
16 Pavilion (P121)
17 New Hospital
18 DENTAC (P171)
19 Mary Walker Clinic (P170)
20 Fritz Field (P303)
WASTEWASTE TREATMENT PLANT
N
Attachment C
Recycled Irrigation
National Training Center
Fort Irwin, CA
CH2MHILL

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LAHONTAN REGION

REVISED MONITORING AND REPORTING
PROGRAM NO. R6V-2004-0005-A1
WDID NO. 6B360703001

FOR

FORT IRWIN NATIONAL TRAINING CENTER
WASTEWATER TREATMENT FACILITY

San Bernardino County

The following constituents shall be added to those listed in Monitoring and Reporting Program No. R6V-2004-0005 Tables 2, 4, and 7, respectively. Sample collection shall be as described in Monitoring and Reporting Program No. R6V-2004-0005. The Discharger may use equivalent alternative analytical methods upon approval. All requirements of Monitoring and Reporting Program No. R6V-2004-0005 remain in effect.

Table 2 – Effluent Monitoring

Constituent	Frequency	Method	Minimum Reporting	Sample Type
Nitrite as N	Monthly	EPA 300	0.1 mg/L	Grab
Total Kjehldahl Nitrogen (TKN)	Monthly	EPA 351	0.1 mg/L	Grab

Table 4 – Recycled Water Use Area Vadose Zone Monitoring

Constituent	Frequency	Method	Minimum Reporting	Sample Type
Nitrite as N	Monthly, see note	EPA 353	0.1 mg/L	Grab
TKN	Monthly, see note	EPA 351	0.1 mg/L	Grab

The Discharger may discontinue vadose zone sampling upon approval of three years of acceptable monitoring and reasonable justification.

Table 7 – Ground Water Monitoring – Analytical Parameters

Constituent	Frequency	Method	Minimum Reporting	Sample Type
Nitrite as N	Semi-Annual	EPA 300	0.1 mg/L	Grab
TKN	Semi-Annual	EPA 351	0.1 mg/L	Grab

Ordered by: _____ Dated: **November 14, 2012**
PATTY Z. KOUYOUMDJIAN
EXECUTIVE OFFICER

JS/rp BO2012/R6V-2004-0005A1_FtIrwin_MRP