

Appendix A

Technical Memo 1

Environmental Regulations and Permitting

TECHNICAL MEMORANDUM – ENVIRONMENTAL REGULATIONS AND PERMITTING

September, 2008

TECHNICAL MEMORANDUM NO. 1

INTRODUCTION

In 1998 the EPA developed a *Water Quality Criteria and Standards Plan* (EPA Plan) that identifies key scientific and technical priorities designed to enhance and improve water quality across the nation. This plan presents priority areas that the EPA will emphasize.

The EPA Plan presents a “vision” and strategy for the EPA to follow:

“The water quality criteria and standards program will fully integrate biocriteria, nutrient criteria and microbial pathogen control with improved chemical-specific criteria, whole effluent toxicity methods and possible sedimentation, flow and wildlife criteria, into criteria and standards programs to better support watershed management for the protection of human health and the maintenance and improvement of the chemical, physical and biological integrity of the Nation’s waters. Future criteria initiatives for excessive sedimentation, flow and wildlife will be investigated.”

This EPA Plan is intended to guide the development and implementation of criteria and standards through enhancing the National Pollutant Discharge Elimination System (NPDES) permitting, non-point source control, Total Maximum Daily Loads (TMDL) determinations, Waste Load Allocations (WLA), wetlands protections, water quality certifications and other EPA regulated water resource management efforts.

More specifically, the EPA Plan is designed to accomplish:

- § The restoration and maintenance of the chemical, physical and biological integrity of the Nation’s waters; and,
- § Attainment of water quality that promotes protection and propagation of fish, shellfish and wildlife and provides for recreation in and on the water; and,
- § Prohibition of the discharge of toxic pollutants in toxic amounts; and,
- § Elimination of the discharge of pollutants to navigable waters.

Since the EPA Plan was published, EPA has produced several Guidance and Criteria documents on key elements within the Plan.

REGULATORY SETTING

The South Tahoe Public Utility District Recycled Water Master Plan focuses on increasing the District’s self-reliance, improving and expanding the transport, storage and use of recycled water

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and on improving the water quality in Indian Creek Reservoir and its downstream system. The projects of the Master Plan will involve permitting and environmental assessment from local, State and Federal agencies. If recycled water is delivered to agricultural lands within the State of Nevada, the State and local requirements of the Nevada agencies will have to be met.

The following agencies have jurisdiction over the use of recycled water in the States of California and Nevada.

The Alpine County Board of Supervisors in California has the authority to review all actions for conformance with local laws, ordinances, and zoning regulations.

The Lahontan Regional Water Quality Control Board (LRWQCB) has regulatory authority to enforce the requirements of the Clean Water Act, the California Water Code, and the California Code of Regulations. This authority includes the regulatory authority to enforce the implementation of TMDLs and the adoption of waste discharge requirements to ensure compliance with water quality standards. The Board has authority to implement the requirements of Title 22 of the California Code of Regulations governing the use of recycled water in California.

The Douglas County Board of Commissioners in Nevada have the authority to review all actions for conformance with local laws, ordinances, and zoning regulations.

The Nevada Division of Water Resources (NDWR) has the authority to permit the use of any water within the State including the use of wastewater effluent. Any person who desires to appropriate public water in the State needs, prior to performing any work, to make application to the State Engineer to change the place of diversion or change in manner or place of use. NDWR also administers permits for the conservation of water resources and for the quantities and manner of use of the various water resources, including the use of effluent. The role of the NDWR in regulating the use of treated effluent is to set maximum quantities of effluent which may be used for specific purposes as part of the State's water conservation efforts.

The Nevada Division of Environmental Protection (NDEP) administers programs designed to protect and enhance the environment of the State including public health and enjoyment, the propagation and protection of terrestrial and aquatic life, the operation of existing industries, the operation of public water and wastewater systems, agricultural, recreational and other activities. The NDEP issues permits that limit the amount of pollutants that can be discharged to the waters of the State. In addition, NDEP assesses, monitors, and issues permits for the discharge and reuse of effluent from wastewater treatment facilities.

Federal agencies with review and /or permitting authority for portions of the Master Plan that will encroach on or impact Federal lands are:

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The U.S. Bureau of Land Management (BLM) manages most of the land where any conveyance ditch improvements would occur. The BLM is responsible for reviewing any proposed construction activity that would involve lands under their jurisdiction. The BLM is the probable “Lead Agency” for any Environmental Assessment that would be necessary to implement improvements to the conveyance ditches.

The U.S. Forest Service (USFS) manages the remaining Federal lands within the Master Plan area that are not under the control of the BLM. They are responsible for reviewing any proposed construction or planning activity for conformity with the Forest Plan.

There are recent changes in key Federal regulatory programs that will have to be considered with any of the elements of the Master Plan.

Revisions to the Water Quality Planning and Management Regulations and Revisions to the National Pollutant Discharge Elimination System Program

On January 1, 2003, the EPA issued a final rule revising the current regulatory requirements for establishing TMDLs for Indian Creek Reservoir under the Clean Water Act.

In the new Rule a TMDL becomes a written, quantitative plan and analysis for attaining and maintaining water quality standards in all seasons for a specific waterbody and pollutant. (40CFR 130.2(h))

The Lahontan Regional Water Quality Control Board listed ICR and Indian Creek on the list of the States Impaired Water Bodies (303d list). This listing prioritizes the development of Total Maximum Daily Loads (TMDL) to control and mitigate the pollutant(s) of concern. Indian Creek Reservoir is designated a cold water fishery; this entails water quality parameters consistent with low production lakes. Because of the ambient nutrient load in the reservoir sediments and water column, the reservoir is highly productive, or eutrophic. The management strategy to improve water quality by decreasing algal production is focused around the management of phosphorus. The following table, Table 1, is a summary of the numeric targets and indicators for ICR, based on the Total Maximum Daily Load and Implementation Plan for ICR, by the California Regional Water Quality Control Board, Lahontan Region, July 2002.

Table 1: Indian Creek Reservoir Water Quality Targets.

Indicator*	Target Value	Reference
Total P concentration	(Interim**) No greater than 0.04 mg/L, annual mean	Current water quality objective (mean of monthly means)
Total P concentration	(Long term**) No greater than 0.02 mg/L, annual mean	USEPA, 1988, 1999
Dissolved oxygen concentration	(Interim**) 30 Day Mean 6.5 mg/L; 7 Day Mean Minimum 5.0 mg/L; 1 Day Minimum 4.0 mg/L	Region-wide water quality objective for waters designated for COLD use

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Dissolved oxygen concentration	(Long term**) Shall not be depressed by more than 10 percent, below 80 percent saturation, or below 7.0 mg/L at any time, whichever is more restrictive	Water quality objective for surface waters of Indian Creek watershed
Secchi depth	Summer mean no less than 2 meters	USEPA, 1988, 1999
Chlorophyll a	Summer mean no greater than 10 ug/l	USEPA, 1988, 1999
Carlson Trophic Status Index	Composite index no greater than 45 units	USEPA, 1988, 1999

*These indicators will be measured for at least one depth profile sampling station in Indian Creek Reservoir. The Carlson Trophic Status Index will be computed from other parameters as explained in the TMDL implementation plan technical staff report.

**Interim targets are expected to be attained by 2013. Long term targets are expected to be attained by 2024.

EPA/USFWS Memorandum of Agreement

The presence of endangered or threatened species should be considered when identifying and evaluating options and alternatives. An example may be the presence of the endangered Lahontan Cutthroat Trout (LCT), stocked by others, in Indian Creek Reservoir in an effort to recover the species in its natural habitat.

The presence of an endangered species in the Reservoir has imposed greater regulatory measures on District operations in Alpine County. In future reviews of water quality and beneficial use standards, TMDLs, and NPDES permits the US Fish and Wildlife Service (FWS) will have a review authority in accordance with a Memorandum of Agreement finalized in January, 2001 between the EPA and the FWS. This MOA provides enhanced coordination under the Clean Water Act and the Endangered Species Act, with specific reference to EPA issuance or approval of State submitted water quality standards and the EPA issuance or review of State submitted point source discharge permits.

This MOA provides the FWS with a review of each action taken by EPA concerning the acceptance or approval of a State water quality standard or action. The FWS review will determine if the water quality standards and beneficial use standards will meet the needs of endangered or threatened species or their habitat. This can subject the EPA approval of State submitted water quality standards and point source discharge permits to a Section 7 Consultation process administered by the FWS through the EPA.

IMPROVE ICR WATER QUALITY THROUGH CONSTRUCTED WETLANDS

The TMDL on Indian Creek Reservoir (ICR) sets a water quality standard for phosphorous. A strategy for achieving this is to run additional fresh water through ICR to flush excess phosphorous from the reservoir; however, concerns exist that this will simply transfer the elevated level of phosphorous to downstream users. A treatment wetland for ICR water located

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at the current ICR outlet to Indian Creek below the Harvey Place Reservoir dam would provide for phosphorous removal and biological nutrient assimilation.

It is important to consider that if a wetland discharges to a water of the United States, (the West Fork of the Carson River and Indian Creek are classified as waters of the U.S.) the discharge will require a NPDES permit. If the concept of constructed treatment wetlands is adopted by the District, it is recommended that the wetland be designed as a closed wetland system, without a discharge to a waterbody regulated by the Clean Water Act.

This wetland area could be used as a backup reuse system in case of an irrigation system failure or the wetland area could be used in lieu of the current operating practice of agricultural reuse. This wetland could be designed to provide a primary function of wildlife habitat and recreational use, additional treatment of the recycled water, or a combination of both functions.

Use of recycled water to create wetlands is not a new concept. Created wetlands have proven to provide an inherent aesthetic appeal to the general public. They can be designed to be an attractive landscape enhancement and a valuable asset to the surrounding areas.

Wildlife access and use of the wetland should be considered carefully. Wetlands generally attract wildlife, a factor that must be considered in the design and management of a wetland. As wildlife and avian species use the wetlands, humans are attracted for bird watching and appreciating the viewing of wildlife. In many wetland areas, interpretive centers and trails or boardwalks are integrated into the design to provide an outdoor experience. However, wetlands using secondary recycled water need to carefully consider the human use to avoid risks to human health.

If the wetland is in or near a populated area, vector control is an essential element in design and management of the wetland. While a wetland can be considered an asset to wildlife, the potential for breeding mosquitoes can be an obstacle to permitting, funding and other steps essential to determining the location of a wetland.

A wetland can be developed with the objective of providing habitat for rare and endangered or threatened species. This objective, if pursued, should be reviewed with the FWS and LRWQCB to determine what species, if any, a wetland in Diamond Valley would support. Since the wetland would not be linked to Indian Creek, assisted species would likely be avian or terrestrial. This objective can bring funding sources through programs sponsored by Federal and State agencies involved with the conservation of habitat and species. However, this approach would also bring with it some degree of Federal oversight and involvement.

If this option is pursued, Federal, State and local regulators should be contacted about site specific criteria including location, discharge requirements (if any), permitting, and possible monitoring requirements including groundwater monitoring.

There are Federal, State and local regulations that may be applicable to permitting a wetland. Examples of some of the key regulations are:

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Clean Water Act and "Waters of the U.S."

"Waters of the United States" or "Waters of the U.S." are those waters regulated by the Clean Water Act (CWA).

The Army Corps of Engineers and the Environmental Protection Agency decide on a case-by-case basis whether or not particular bodies of water are waters of the U.S. A wetland constructed in upland areas generally will not be considered a water of the U.S. However, as a wetland matures and develops characteristics (hydrology, soils, vegetation) it may become eligible for designation as a water of the U.S.

If a constructed wetland, or a portion of a constructed wetland, is considered a water of the U.S., it falls under the jurisdiction of the CWA, and one or more of the following sections of the CWA may apply. If a constructed wetland is not itself a water of the U.S. but discharges pollutants into a water of the U.S., the discharge requires a permit under CWA Section 402.

Clean Water Act Section 303 Water Quality Standards.

Under the CWA, the State, with the approval of the EPA, has the authority to adopt water quality standards for all waters of the U.S., including wetlands. Water quality standards must include, at a minimum, the following three major components:

- 1) Designated uses for water bodies – Each water body is given one or more designated uses, such as “groundwater recharge” or “aquatic life support” with the goal to achieve, protect and maintain these designated uses.
- 2) Water quality criteria to protect the designated uses– Water quality criteria are developed to support the designated uses. The criteria can be numeric limits or narrative statements on factors affecting the waterbody’s health. It is common for States to include biological criteria, in addition to the more traditional physical and chemical criteria, to help determine the health of wetlands.
- 3) Antidegradation policy – This must be included and be consistent with the water quality standards and must develop appropriate implementation procedures. Antidegradation policies, must, at a minimum, maintain and protect existing stream uses and the level of water quality necessary to protect the existing uses.

Permits for discharges to waters of the U.S., including jurisdictional wetlands, must ensure the discharges will not cause or contribute to a violation of water quality criteria or impair designated uses in the receiving water or downstream waters.

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Clean Water Act Section 401 Certification.

Constructed wetlands involving a federally licensed activity that may result in discharges to waters of the U.S. (Such as a CWA Section 402 permit from EPA or a 404 permit from the U.S. Army Corps of Engineers) require certification under Section 401 of the CWA. A permit application will need certification that the proposed activity will not violate the State's water quality standards or other State requirements. This certification must come from the State in whose geographic jurisdiction the discharge would occur. The state may place conditions on its certification that are intended to prevent such violations, or the State may waive certification.

Clean Water Act Section 402.

The CWA Section 402 program, also known as the National Pollutant Discharge Elimination System (NPDES) program, regulates the discharge of pollutants (other than dredged or fill material, which is covered under Section 404 of the Clean Water Act) from point sources into waters of the U.S. The State of California and the State of Nevada are authorized by the EPA to administer the NPDES permitting program within their individual state boundaries. The construction and/or operation of a wetland may involve these discharges to waters of the U.S. and, as a result, require an NPDES permit. If construction of a wetland will disturb 5 acres or more (one acre expected to apply in 2002), an NPDES permit for the discharge of storm water is required.

Clean Water Act Section 404.

If construction activities associated with the wetlands involve the discharge of dredged or fill material (e.g. rock, sand, and soil) to waters of the U.S., an authorization under CWA Section 404 is needed. At the Federal level, the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency (EPA) administer the 404 program. The U.S. Fish and Wildlife Service (FWS), under the MOA, have an important oversight and advisory role. The Corps has the primary responsibility for the permit program and is authorized, after notice and opportunity for public hearing, to issue permits for the discharge of dredged or fill materials. The EPA's responsibilities include development of the environmental guidelines by which the permit applications are evaluated and review of proposed permits.

For example, if a constructed wetlands plan includes construction of water control structures, such as berms or levees, that involves discharge of dredged or fill material into a water of the U.S., the construction will require authorization under Section 404. Subsequent maintenance may also require a permit (although Section 404(f) may exempt some routine maintenance from 404 permitting requirements).

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MODIFY EXISTING CALIFORNIA RECYCLED WATER OPERATIONS

The current agricultural reuse programs include the release of water from Harvey Place Reservoir to the Diamond Ditch. The effluent is then transported along the southerly side of Indian Creek in a concrete lined ditch for approximately 2 miles where the ditch crosses Indian Creek through a 24” and 30” siphon. The ditch then heads in a northwesterly direction to a junction with the Snowshoe Thompson No.2 Ditch (not in service). This reach of the Diamond Ditch delivers water to the Ace Hereford, Celio and Brooke properties in Wade Valley. The Diamond Ditch system continues from Wade Valley in a northerly direction, paralleling the West Fork of the Carson River to Paynsville Bridge, where it crosses the West Fork through a non-cased 14” steel pipe. District responsibilities west of the West Fork end just after the Paynesville Bridge crossing. From here, contract irrigators blend recycled water from the Diamond Ditch with fresh water in the Fredericksburg Ditch system. The blended water continues in a northwesterly direction for approximately 5 miles irrigating the Neddenriep, Bruns, and Gansberg fields within the State of California.

Recycled Water Quality

Title 22 of the California Code of Regulations governs use of recycled water in California. The Code currently defines the level of treatment required for various beneficial uses of recycled water. The four categories of treated water are:

- § *Un-disinfected Secondary Water* – Oxidized Wastewater
- § *Disinfected Secondary 23* – Water that has been oxidized and disinfected so that the median concentration of total coliform bacteria does not exceed a Most Probable Number (MPN) of 23 per 100 ml and the single day maximum does not exceed a MPN of 240 per 100 ml in any 30 day period.
- § *Disinfected Secondary 2.2* – as above except the median MPN must be below 2.2 and the single day maximum below 23.
- § *Disinfected Tertiary Water* – Filtered and disinfected wastewater that has either been disinfected with a C x t [disinfection concentration (mg/l) multiplied by contact time (minutes)] value of at least 450 and a minimum contact time of 90 minutes or removal of 99.999% (5-log) of f-specific bacteriophage MS2, or polio and median concentration of total coliform MPN of 2.2 or less and a maximum single day total coliform MPN less than 23.

The District’s wastewater treatment plant is currently permitted as Secondary 23 recycled water; however, the plant has consistently met the Secondary 2.2 criteria for the past several years.

Recycled Water Policy

The California State Water Resources Control Board (SWRCB) is developing a statewide Recycled Water Policy to establish more uniform requirements for recycled water projects.

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Workshops have been held to include the public in this process, with the most recent State Water Board adoption hearing for this proposed Policy held March 18, 2008. The most current version of the document is available from the SWRCB web page, http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/.

The ultimate goal of the proposed Policy is to provide an incentive for development of salt (including nutrient) management plans by recycled water dischargers in groundwater basins that are threatened by salts. In general, nutrient management practices may be required for irrigation projects when the recycled water exceeds three milligrams per liter (mg/l) of total nitrogen (the District recycled water averages above 20 mg/l total nitrogen). For the purposes of recycled water application, nutrient management means consideration of nutrient concentrations present in the recycled water when calculating fertilizer application rates. The time frame for development of salt management plans will likely be five years after the date of a Regional Water Board finding that a particular groundwater basin is threatened by salts, with a possible additional five-year extension. The salt management plans must include a description of the best practicable treatment or control measures necessary to prevent salt or nutrient-related pollution or nuisance.

During the interim period prior to approval of salt management plans, a recycled water applicator (such as the District or contract irrigators) can reasonably control discharges of salts to groundwater by implementing nutrient management practices, and by applying recycled water in an amount that does not exceed the amount needed for vegetation or crops. For recycled water projects operating during the interim period, the monthly average total dissolved solids (TDS) level of the recycled water shall not exceed the monthly average TDS of the source water plus 550 mg/L. In addition, since the total nitrogen in District recycled water is greater than three mg/l, the Lahontan Water Board may require the District to educate its contract irrigators about the need to consider nutrient concentrations present in recycled water when calculating fertilizer application rates. The Policy also grants the Regional Water Boards authority to continue to require groundwater monitoring for crops irrigated with recycled water. The requirements listed here are distinguished from ongoing requirements such as responsibility for any past or continuing recycled water discharge that violates existing or new, more stringent drinking water quality standards promulgated after a Regional Water Board establishes guidelines for a project. Responsibility may include providing an alternative drinking water supply or enacting wellhead treatment for affected parties.

Use Area Requirements

The Porter-Cologne Water Quality Control Act defines “waters of the State” as “any water, surface or underground, including saline waters, within the boundaries of the State.” The Basin Plan includes a Nondegradation objective that implements the State of California policy for nondegradation of water quality in surface and groundwater systems.

The Basin Plan water quality objective for all ground waters specifies that:

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“Ground waters designated as MUN (municipal or domestic water supply) shall not contain concentrations in excess of the maximum contaminant level (MCL) or secondary maximum contaminant level (SMCL) based upon drinking water standards specified in the following provisions of Title 22 of the California Code of Regulations which are incorporated by reference in this plan: Table 64431d-A of section 64431 (inorganic Chemicals), Table 64431B of Section 64431 (Fluoride), Table 64444-A of section 64449 (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits), and table 64449-B of Section 64449 (Secondary Maximum Contaminant Levels-Ranges).”

The Porter-Cologne Act provides for the reuse of reclaimed wastewater effluent pursuant to a uniform statewide reclamation criterion that specifies that the use of reclaimed water “does not cause, constitute, or contribute to, any form of contamination”. This act allows Regional Boards to issue master reclamation permits for suppliers and/or distributors of reclaimed water. Master reclamation permits must include waste discharge requirements and requirements for the following:

- § Compliance with statewide reclamation criteria,
- § Establishment and enforcement by the permittee of rules or regulations for reclaimed water users,
- § Quarterly reporting on reclaimed water use, and
- § Periodic compliance inspections of water users by the permittee.

The Basin Plan includes in Section 4.4 reclamation control measures for the Indian Creek watershed. The Basin Plan specifies that the Board must regulate the use of reclaimed water for irrigation purposes with other discharges such as septic systems and other irrigation practices. The Basin Plan states that the Regional Board should maintain stringent waste discharge requirements for the irrigation of agricultural lands with District’s effluent including extensive monitoring to ensure that public health is adequately protected.

The waste discharge requirements for ranchers irrigating with effluent must include control measures including among the following:

- § Effluent cannot be applied during the winter period,
- § Strict effluent limits for Total Coliform Organisms,
- § Provisions for assessment of risks of ground water contamination from the application of effluent,
- § Buffer areas for ground water wells, dwellings and traveled ways, and
- § Ground and surface water monitoring to assess impacts of irrigation return flows.

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In order to remain in compliance with these limits, Title 22, California Code of Regulations requires the following control measures when irrigating with Secondary 23 recycled water:

- § Cross Connection Control – No physical connection may exist between pipes carrying treated effluent and the potable water system. Where effluent is piped to the reuse area a cross connection control plan is necessary to ensure the safety of the potable water system. No hose bibs may be used on pipes carrying treated effluent except the quick-connect type to prevent contamination of normal garden hoses.
- § Domestic Well Setback – No impoundment of or irrigation with Disinfected Secondary 23 recycled water shall occur within 100 ft of a domestic well. Repermitting to Secondary 2.2 water will not change the setback requirement.
- § Residence Setback – No spray irrigation is allowed within 100 ft of a residence or place where public exposure could be similar to that of a park or playground for Secondary 23 and Secondary 2.2 water.
- § Runoff – Irrigation runoff shall be confined to the recycled water use area unless otherwise authorized by the regulatory agency. (Contract irrigator permits from Lahontan should be amended to indicate that tailwater may flow into Nevada, as permitted by the NDEP.)
- § Drinking Water – Drinking water fountains must be protected against contact with recycled water spray, mist or runoff.
- § Signage – All use areas where recycled water is used that are accessible to the public shall be posted with conspicuous signs, no less than 4 inches high by 8 inches wide, that include the wording “RECYCLED WATER – DO NOT DRINK”.

The LRWQCB and the Alpine County Health Department have indicated that they would judge an unlined irrigation ditch that carries recycled water at any time or any field that is irrigated with recycled water at any time as though it is using only recycled water. For the purposes of determining domestic well setback, unlined irrigation channels would most likely be considered impoundments. The determination of a site as being “Accessible to the Public” for signage requirements is done on a case-by-case basis by the County Health Department.

NUTRIENT REMOVAL CONSIDERATIONS

The ability of the District’s wastewater treatment plant to remove nutrients, particularly nitrogen, will not be a significant issue in the determination of reuse applications for irrigation. Data from Growth and Mineral Nutrition of Field Crops (Fageria et.al., 1991), all common animal feed crops have nitrogen uses near the water application limits of the soil. At 20-mg/l total nitrogen, alfalfa would require 4.5 to 6.5 ac-ft of recycled water per acre of crop to satisfy its nitrogen requirement. Similarly, barley would require approximately 3.3 ac-ft per acre. These amounts assume that 50% of the required nitrogen is fixed from the atmosphere by the plant, 20% of the

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nitrogen is denitrified and vaporized naturally and 7 mg/l of nitrogen percolates past the root zone. These limits are near the current application rates.

Fire Protection

The District's WWTP recycled water pipeline is currently supplying a fire hydrant system at Woodfords, CA. The system consists of four fire hydrants in the community, and was designed to use recycled water because of the lack of sufficient groundwater pumping capacity to support firefighting activity. Title 22, CCR, requires that recycled water used for structural firefighting be disinfected tertiary recycled water. Disinfected Secondary 23 recycled water may be used for non-structural firefighting.

Expanded Uses

In addition to irrigation, recycled water can be used for numerous commercial and industrial purposes provided it meets certain quality criteria. The quality of the recycled water from the District wastewater treatment plant limits its use to activities that minimize the likelihood of human contact. These include non-structural firefighting, boiler feed water, soil compaction and dust control. The only added benefit of re-permitting to Secondary 2.2 water would be to allow the irrigation of human food crops where the irrigation water does not contact the edible portion (e.g. flood irrigation of fruit trees).

Any industrial application that requires the recycled water to be piped into a facility must include a cross connection control plan and adopt backflow prevention measures. Title 17 of the California Code of Regulations includes a list of the required backflow protection based on application and potential risk. Applications in this category would include boiler feed water or cooling and air conditioning where no mist is created.

RECYCLED WATER REUSE IN NEVADA

Due to the proximity of the recycled water use area to the California-Nevada state line, potential exists for the District to transport water into Nevada for crop or pasture irrigation. Nevada's laws concerning recycled water use are substantially similar in intent but seem to be more rigid in their structure and requirements placed on the end user.

Water Quality

The Nevada Department of Environmental Protection, Bureau of Water Pollution Control, governs recycled water reuse in Nevada. To be considered for reuse, the recycled water must be at least secondary treated recycled water, defined as having been oxidized to the point where the 5-day biochemical oxygen demand (BOD₅) of the recycled water is less than 30 milligrams per liter of BOD. The level of total coliform in the recycled water determines the purposes for which it can be used as well as the buffer zone around the use area. Finally, the total amount of nitrogen and the amounts of each species, (ammonia, nitrate, organic) are considered when determining the suitability of recycled water for a given purpose. Irrigation of animal feed crops carries the lowest quality requirements and the only limitation is the nitrogen uptake ability of

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the plants. The required coliform levels and buffer zones for the four classifications are shown in Table 2 .

Table 2				
State of Nevada Buffer Zone Requirements				
Reuse Classification	Fecal Coliform MPN/100 ml or c.f.u.			
	A	A(1)	B	C
30 Day Geometric Mean	No Limit	200	23	2.2
Maximum Daily Number	No Limit	400	240	23
Buffer Zone (ft)	800	400	100	0

- § Category A uses – Pasture or other agricultural purposes except growing crops for human consumption, where public access to the site is prohibited
- § Category A(1) – Same as A. The higher quality allows for a smaller buffer zone.
- § Category B – Golf courses, cemeteries, greenbelts where public access is controlled and human contact with the recycled water does not occur; an impoundment where human activity is prohibited and contact with the recycled water does not occur.
- § Category C – Cemetery, park, playground where access is controlled and contact with the recycled water cannot reasonably be expected; impoundments where full body contact with the recycled water cannot reasonably be expected.

The relevant sections of Nevada law are contained in the Nevada Administrative Code, Sections 445A.275 through 445A.280. In addition to compliance with these regulations, NDEP requires an Effluent Management Plan be submitted by the recycled water user and approved prior to the use of recycled water. The NDEP has prepared the documents General Design Criteria for Reclaimed Water Irrigation Use and General Criteria for Preparing an Effluent Management Plan to assist in preparing the required plan. These documents describe the current requirements and are subject to change as reclaimed water use grows. The most current version of the document is available from the NDEP web page, <http://www.state.nv.us/ndep>, at the Publications and Fact Sheets link.

In addition to the Bureau of Water Pollution Control, the Nevada Division of Water Resources must be contacted prior to the use of reclaimed water in order to address requirements for secondary water rights. The Nevada State Health Division must also be contacted to ensure reclaimed water use is in accordance with water supply protection requirements.

Effluent Management Plan

The proposed user of reclaimed water in Nevada must secure a permit from NDEP prior to beginning use and must submit an Effluent Management Plan (EMP) describing the proposed

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recycled water reuse. The EMP provides the details of the project, measures to be taken to prevent contamination of ground and surface water, plant nutrient consumptive use budgets and plant water consumptive use budgets. The plan must be prepared and stamped by a qualified Nevada Registered Professional Engineer.

An application for a new use of reclaimed water must be submitted 180 days prior to the anticipated beginning of usage. The specific regulations for permits are contained in the Nevada Administrative Code section 445A.228 through 445A.263.

Irrigation Uses

The use of treated recycled water for the irrigation of animal feed crops is a category A application of recycled water. The user must include in the EMP a nitrogen budget for the crops to ensure the plants will use the nitrogen and not pollute ground or surface water. There is no specific limit to the amount of nitrogen in the recycled water or the nitrogen species in the NAC but recycled water with total nitrogen greater than 10 mg/l may require down-gradient monitoring to ensure ground and surface waters are not being polluted. The Bureau of Water Pollution Control will evaluate each proposed use and the characteristics of the recycled water for determination of suitability and monitoring requirements.

Recycled water from the District's wastewater treatment plant constantly meets the Category B (secondary 23 water) coliform limits and is below the Category C (secondary 2.2 water) levels much of the time. The total nitrogen level, ~ 20 mg/l, is appropriate for alfalfa and other animal feed crops however the Bureau of Water Pollution Control may require down gradient monitoring.

The District's recycled water is appropriate for other irrigation applications such as greenbelts and golf courses. Repermitting to Category C (secondary 2.2) water will eliminate the buffer zone requirement and allow greater flexibility in its use in urban irrigation.

Nevada specifically prohibits the use of treated recycled water for the irrigation of food crops and this restriction is not expected to change in the foreseeable future.

Expanded Use of Recycled Water in Nevada

In addition to irrigation the NDEP recognizes the use of reclaimed water for dust control, industrial cooling applications and creation of wetlands. Other uses of reclaimed water will be considered on a case-by-case basis by the Division with appropriate controls and requirements determined by NDEP. The suitability of treated recycled water will be determined based on the MPN of coliform, BOD₅ and total nitrogen.

The level of coliform in the recycled water typically is the limiting factor in determining suitability of recycled water for industrial applications due to the increased likelihood of human exposure in an industrial setting. Applications where human contact is less likely require Category B (Secondary 23) water. These include boiler feed water and dust control. The high quality of the recycled water in this respect will allow it to be used for most non-contact

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purposes with no additional treatment. Industrial users are typically not subject to BOD₅ and total nitrogen limits.

Recycled water supported wetlands currently provide animal and plant habitat as well as some recreation benefits (birding, hunting) in Douglas County, NV. The limiting factors in suitability of recycled water for wetlands are BOD₅ and total nitrogen. Typical limits for these constituents are BOD₅ < 30 milligrams per liter and total nitrogen < 10 milligrams per liter. While each potential use of recycled water is judged on a case-by-case basis, these values are typical for discharge to wetlands. The District's recycled water currently has approximately 20 milligrams per liter total nitrogen, mostly ammonia. This would severely limit the potential uses of the recycled water for wetlands in Nevada without additional nitrogen removal. Wetlands constructed for the intention of providing additional wastewater treatment would not be subject to these limits.

ANTICIPATED PERMITTING REQUIREMENTS

The Federal, State and Alpine County permits likely to be required for the proposed Master Plan projects are outlined in Tables 3, 4 and 5 below.

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Table 3. Federal Permits Likely to be required for the Recycled Water Facilities Master Plan Strategies

Federal Permits	National Environmental Policy Act (NEPA) Documentation	Section 404 of the Clean Water Act	Endangered Species Act
Issuing Agency	U.S. Forest Service and U.S. Bureau of Land Management acting as cooperating agencies	U.S. Army Corps of Engineers	U. S. Fish and Wildlife Service
Address		Dept. of the Army U.S. Army Corps of Engineers Nevada Field Office 300 Booth Street, Room 2103 Reno, Nevada 89509	Nevada Fish And Wildlife Office
Regulated Activity	Federal agencies must conduct environmental review before undertaking any action that could affect the environment, including allowing the use of federally managed lands. Environmental requirements under NEPA may be met by completion of an Environmental Assessment (EA) or Environmental Impact Statement (EIS). An EIS would likely be necessary for this project.	Required for activities that involves deposit of "fill material" into "waters of the U.S." as defined by COE (wetlands, streams, lakes, ponds). Fill material includes earth, culverts, riprap, and pipelines).	Disturbance of vegetation and wildlife, including fishery, and habitat, particularly threatened and endangered species.
Responsible Party	Property owner/contractor.	Property owner/contractor.	Project proponent. Formal consultation to determine if a "take permit" is necessary. Federal Actions or projects affecting federal lands require formal consultation between the affected federal agencies under Section 7 of the Endangered Species Act.
Application Schedule	Application required prior to activity	Application required prior to activity	
Application Process	Preparation of an Environmental Impact Statement documenting the Purpose and Need, Alternatives Considered, Project Description. An analysis of potential impacts and recommended mitigation designed to reduce those impacts to a level of non-significance.	ENG Form 4345. Projects with minor effects to waters of the U.S. may meet Nationwide permit conditions. Application process also requires compliance with Federal Endangered Species Act (Section 7 consultation if federal action is required), State Water Quality Certification, and State Historic Preservation Office under Section 106.	Preparation of a Biological Assessment discussing the potential impacts and recommended impacts to threatened or endangered species. Formal consultation must be initiated by a federal agency.

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Table 4. State Permits Likely to be Required for the Recycled Water Facilities Master Plan Strategies

State Permits	Storm Water Discharge Permit for Construction Activities	Temporary Authority to Discharge	Section 401 Water Quality Certification	Rolling Stock Permit	Historic Preservation Act	Wildlife and Habitat
Regulated Activity	Required for construction site over five acres that will discharge storm runoff to waters of the U.S. or the storm drain system.	Temporary 1 year) point-source discharge to "waters of the U.S." as defined by the U.S. Army Corps of Engineers	Required for equipment operating in "waters of the U.S." as defined by the U.S. Army Corps of Engineers.	Required for equipment operating in "waters of the U.S." as defined by the U.S. Army Corps of Engineers.	Required to have clearance if federal action (including Army Corps of Engineers Section 404 permit) is required.	Disturbance of wildlife or wildlife habitat.
Responsible Party Application Schedule	Contractor, property owner must submit. Required prior to construction activity.	Required prior to construction.	Required prior to activity	Required prior to activity	Required prior to activity	Project proponent may request informal consultation prior to beginning activity.
Application Process	Requires application form, notice of intent, and Storm Water Pollution Prevention Plan.	Application form. See Application Information	Submit EPA Form I Site Plan, latitude/longitude and 401/404 clearance (if required)	Submit EPA Form I Site Plan, latitude/longitude and 401/404 clearance (if required)	Contact the agency. Depending on location and site condition, a field survey by an approved archaeologist may be required.	Informal letter request for consultation should include project description, schedule, map of site, and list of other required permits (401 certification or 404 permit)
Approximate Processing Time	7 to 14 business days.	1 to 6 months	4 to 6 weeks	4 to 2 weeks	1 to 2 months	2 months
Estimated Fees	<u>\$200 application fee in addition to project specific fees.</u>	<u>\$250 application fee</u>	<u>\$250 application fee</u>	<u>\$250 application fee</u>	<u>There is no fee for authorization. Fees may be incurred for archaeological survey.</u>	<u>No application fee</u>

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Table 5. Alpine County Permits Likely to be Required for the Indian Creek Facilities Master Plan Strategies

Permits	County Dust Control Permit	County Construction Permit	County Encroachment Permit	Operating Permit
Regulated Activity	Required for dust emissions from construction, grading, and trenching.	This is a preconstruction permit that describes the type of facility, and duration of construction.	Required for construction, excavation, installation, or occupancy within county right of ways.	This permit follows the Authority to Construct Permit following construction of the facility and allows facility operation.
Responsible Party Application Schedule	Contractor - Required prior to earth moving activities.	Required prior to construction. Also need to obtain a Dust Control/Grading Permit prior to earth moving activities.	Required prior to activity.	Required prior to operation.
Application Process	Application Form, project location map, dust migration plan.	Application for Authority to Construct, plans, maps, etc.	N/A	Application for operating permit, detailed description operation, hours of operation, BACT, pollution control measures, etc.
Approximate Processing Time	4 weeks	1 to 6 months, provided no hearings.	4 weeks	1 month
Estimated Fees	<u>\$90 per acre (approximate)</u>	<u>\$246 application fee. (approximate) plus equipment permitting fees</u>	<u>\$100 application fee plus project specific fees</u>	<u>\$246 application fee (approximate) plus annual equipment permitting fees</u>

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The original draft of this technical memorandum was prepared by Kennedy/Jenks Consultants in 2003 and updated by Stantec Consulting in 2008.

REFERENCES

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