

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION

FACT SHEET (Pursuant to NAC 445A.236) April 2007

PERMITTEE NAME: The Walters Group – Golf Club Illinois Incorporated
5500 East Flamingo Road
Las Vegas, Nevada 89122

PERMIT NUMBER: NEV98000

LOCATION: Royal Links Golf Club
5995 Vegas Valley Drive
Las Vegas, Nevada 89122

Latitude: 36° 08' 08" North
Longitude: 115° 02' 52" West
Latitude/Longitude at Golf Course Clubhouse
Sections 9 & 10, T21S, R62E

PUBLIC WATER SUPPLY: No public water supply wells are located within a 7,000-foot buffer zone.

FLOW: 1.75 million gallons per day (MGD) (30-Day Average)
2.2 MGD (Daily Maximum)

Outfall 001: Discharge of City of Las Vegas Water Pollution Control Facility (NV0020133) reclaimed wastewater to groundwater via percolation through reuse irrigation of the Royal Links Golf Club Golf Course.

GENERAL:

The Walters Group operates Royal Links Golf Club Golf Course, an 18 hole golf course located on 147.6 acres at 5995 Vegas Valley Drive, Las Vegas, Clark County, Nevada 89142, with sections of the course on both the North and South sides of Vegas Valley Drive. The City of Las Vegas Water Pollution Control Facility (CLVPCF) supplies tertiary treated (Reuse Category B, NAC 445A.276), nitrified, and disinfected effluent to the golf course for irrigation of golf course turf and other landscaped areas. Irrigation using treated effluent is conducted in accordance with an Effluent Management Plan (EMP) submitted to, and approved by, the Nevada Division of Environmental Protection, Bureau of Water Pollution Control (BWPC).

LOCATION OF THE DISCHARGE:

The golf course is located immediately North and West of the CLVPCF. The Las Vegas Wash is the North-Northeast boundary of the golf course, extending Southward along the East side of the adjacent CLVPCF.

DISCHARGE CHARACTERISTICS:

Water used for irrigation is tertiary-treated, nitrified, and disinfected wastewater from the CLVPCF wastewater treatment facility (NAC 445A.276, Reuse Category B). Treated effluent delivered to the golf course (conventional pollutants) is characterized as follows:

PARAMETER	30-DAY AVERAGE ¹
Flow, MGD	0.88
Fecal Coliform, CFU/100 ml	1.1
Uninhibited Biochemical Oxygen Demand (BOD ₅), mg/L	1.0

Total Suspended Solids (TSS), mg/L	1.0
Total Nitrogen as N, mg/L	19.1
Nitrate as N, mg/L	18.3
pH, S.U.	6.7

¹: January 2004 through December 2006.

RECEIVING WATER CHARACTERISTICS:

Treated effluent used for irrigation discharges to groundwater via percolation. Groundwater is reportedly encountered at approximately 14.5-19.5 feet below grade surface (bgs). Groundwater in the vicinity of the golf course has exhibited historically elevated concentrations of Total Nitrogen (up to 90 mg/L, January 2002) and total dissolved solids (TDS) concentrations ranging from 2,000 to 8,000 mg/L (July 1998 to October 2006). Groundwater is reported to flow to the east-southeast toward the CLVPCF facility and the Las Vegas Wash. Groundwater characteristics as measured from the four (4) monitoring wells are as follows:

Parameter ¹	Depth to Groundwater (bgs, feet)	Total Dissolved Solids (mg/L)	Chloride (mg/L)	Total Nitrogen (mg/L)	Oxidized Nitrogen (mg/L)
Links West ²	18.88	5706	520	25.6	24.0
Links South ³	16.05	3699	419	27.8	26.2
Links North ²	17.95	4861	466	5.0	3.7
Links East ³	17.38	5587	441	17.0	15.9

¹: Average measurements/concentrations (quarterly), January 2004 to October 2006.

²: Upgradient monitoring well.

³: Downgradient monitoring well.

EXISTING MONITORING CONDITIONS:

The golf course uses four (4) groundwater monitoring wells to evaluate groundwater conditions at locations upgradient and downgradient of the two (2) primary areas of irrigation. The wells are identified as: Links West, Links North, Links East, and Links South. Links West and Links North are regarded as upgradient wells, while Links East and Links South are the downgradient monitoring wells.

TDS concentrations at the four (4) monitoring well locations ranged between 2,070 and 6,530 mg/L (January 2004-October 2006). Chloride concentrations jump around quite a bit, however, the upgradient monitoring wells have higher average concentrations than the downgradient wells (West and North wells, 520 mg/L and 466 mg/L respectively and East and South wells 441 mg/L and 419 mg/L respectively (January 2004-October 2006)). For the period January 2004 to October 2006, the West monitoring well averaged 25.6 mg/L Total Nitrogen (TN) while the other upgradient monitoring well, the North well averaged 5.0 mg/L. During the same period the downgradient wells, East and South averaged TN concentrations of 17.0 mg/L and 27.8 mg/L, respectively.

Elevated TN concentrations in groundwater at the Links West monitoring well location have been generally attributed to the historic presence of septic systems located immediately to the north-northwest of the Links West monitoring well location. A recent review of an old topographic map indicates that at least part of the Links golf course (the Northeastern portion of the Southern part, i.e., the part South of Vegas Valley Drive) was constructed over a former sludge drying bed area of the CLVPCF. This may account for some of the higher concentrations of TN in the downgradient monitoring wells. For the last one and a half years the TN concentrations do appear to be exhibiting a downward trend from the extremely high concentrations reported from early 1999 to January 2002. Over application of nitrogen both as fertilizer and in effluent may have contributed to the high TN readings in the monitoring wells from 1999 to 2002. Constant vigilance and adjustments of the application rates of nitrogen (both effluent and fertilizer) must be maintained to prevent a re-occurrence of the extreme groundwater total nitrogen concentrations. An updated nitrogen uptake balance shall be submitted annually as part of the 4th quarter (annual) report, with adjustments being made to total nitrogen applications in response to the results of monitoring well samples. Increased monitoring and/or an

increase in the number of monitoring wells may be required if the monitoring wells again exhibit an increasing trend in total nitrogen

PROPOSED LIMITATIONS:

Proposed limitations are designed to verify the constituent composition of effluent discharges and control application and operational parameters to protect groundwater conditions.

During the period beginning on the effective date of this permit and lasting until the permit expires, the Permittee is authorized to discharge treated wastewater effluent for irrigation of Royal Links Golf Club Golf Course.

Samples and/or measurements taken in compliance with the monitoring requirements specified below shall be collected:

- At a flow meter accessible at the facility and available for routine measurement; and
- After treatment and prior to distribution for reuse. Data may be obtained from the City of Las Vegas Water Pollution Control Facility to satisfy compliance and reporting requirements confirming effluent quality.

Effluent Reuse Limitations

The discharge shall be limited and monitored as specified below:

PARAMETERS	DISCHARGE LIMITATIONS			MONITORING REQUIREMENTS	
	30-Day Average	Daily Maximum	Monthly Total	Measurement Frequency	Sample Type
Flow (MGD)	1.75	2.2	----	Continuous	Flow Meter
Total Application Volume (gallons)	----	----	Monitor & Report	Monthly	Flow Meter or Totalizer
Fecal Coliform ^{1,4} (CFU/100 mL)	2.2	23	----	Weekly	Discrete
Nitrate as N ⁴ (mg/L)	Monitor & Report			Weekly	Discrete
Total Nitrogen as N ⁴ (mg/L)	Monitor & Report			Weekly	Discrete
Total Nitrogen Applied (pounds)	Monitor & Report			Monthly	Calculation
Total Nitrogen Applied (pounds/calendar year) ²	55,210 ³			Quarterly	Calculation (cumulative)

MGD: Million gallons per day
 CFU/100 mL: Colony forming units per 100 milliliters
 mg/L: Milligrams per liter
 as N: As nitrogen

¹: Fecal coliform concentrations meets Reuse Category B standards (NAC 445A.276).

²: The total annual nitrogen applied (lbs/acre/year) shall not be greater than the total annual nitrogen uptake (lbs/acre/year). Calculations and monitoring data shall use the **total nitrogen** in the applied wastewater (monitored by the treatment facility), total nitrogen from fertilizer applications, nitrogen

uptake by crops or vegetation, evapotranspiration rate, precipitation rate, and fraction of applied nitrogen removed by denitrification and volatilization. Quarterly accounting of nitrogen load is required to more frequently evaluate the amount of nitrogen applied throughout the progression of a calendar year. Each quarter, the cumulative amount of total nitrogen applied shall be increased by the incremental amount of nitrogen applied during the reported quarter. Data provided in the fourth quarter annual report must demonstrate compliance with the annual nitrogen load allocated.

- 3: This value is obtained from the nutrient uptake calculations (Hydrotech Consulting Services, LLC, dated 3.18.07) presented as part of the application package (374 pounds per acre per year x 147.6 acres = 55,210 pounds per year).
- 4: Analytical monitoring may be performed by the supplier of the effluent; however, analytical results must be reported by the Permittee to verify compliance with effluent reuse limitations in accordance quarterly reporting requirements.

Groundwater Monitoring Requirements

Monitoring wells installed shall be sampled for the presence of nitrogen compounds, TDS, and chloride. Monitoring wells shall be measured and sampled according to the following parameters:

Groundwater Monitoring Requirements

PARAMETERS	GROUNDWATER LIMITATIONS	SAMPLE LOCATIONS ¹	MONITORING REQUIREMENTS	
			Measurement Frequency	Sample Type
Depth to Water (feet)	Monitor & Report	Each well	Quarterly	Discrete Measurement
Groundwater Elevation (msl)	Monitor & Report	Each well	Quarterly	Discrete Measurement
Groundwater Gradient and Flow Direction (foot/foot)	Report	-----	Biennially	Calculate & Illustrate ²
Total Nitrogen as N (mg/L)	Monitor & Report	Each well	Quarterly	Discrete
Nitrate as N (mg/L)	Monitor & Report	Each well	Quarterly	Discrete
Total Dissolved Solids (mg/L)	Monitor & Report	Each well	Quarterly	Discrete
Chloride (mg/L)	Monitor & Report	Each well	Quarterly	Discrete

msl: mean sea level (above)
 mg/L: milligram per liter
 as N: as Nitrogen

- 1: Monitoring Wells currently include: MW-1, 2, 3, and 4, also referred to as Links West, Links North, Links East, and Links South, respectively. All groundwater monitoring wells installed as a function of the permitted discharge shall be included in the monitoring program prescribed.
- 2: Report in 4th quarter (annual) report in odd numbered years. Groundwater gradient and flow direction shall be calculated based on surveyed well locations and casing elevations. Well locations must be clearly labeled on a scaled map illustrating and denoting the groundwater gradient and flow direction.

Rationale for Permit Requirements

The limitations and monitoring requirements instituted are intended to provide for an effective and appropriate application of treated effluent and to verify that reclaimed effluent reuse does not further degrade existing groundwater conditions.

Effluent Reuse Limitations:

Numeric standards for reclaimed wastewater analytes are based on the City of Las Vegas Water Pollution Control Facility Permit NV0020133, which allow reuse under prescribed conditions. Fecal coliform limitations are based on reuse Category B (NAC 445A.276.1.) bacteriological quality to allow a zero-distance buffer zone.

Groundwater Monitoring:

Groundwater monitoring is necessary to evaluate upgradient and downgradient groundwater quality to assess the propensity for site operations to further impact groundwater.

SCHEDULE OF COMPLIANCE: The Permittee shall implement and comply with the provisions of the schedule of compliance, including in said implementation and compliance, any additions or modifications which the Administrator may make in approving the schedule of compliance.

- Upon issuance of the permit, the Permittee shall achieve compliance with all discharge limitations.
- Within 90 days (Month XX, 2007) of the permit issuance, an updated EMP, prepared and stamped by a Nevada licensed professional engineer, shall be submitted to the Division for approval. The Permittee shall not use reclaimed water after the 90-day due date without having submitted a redrafted EMP per NAC 445A.275, unless granted otherwise by the Division. The Permittee shall submit the updated EMP to:

Mr. Nadir Sous
Bureau of Water Pollution Control
2030 E. Flamingo Rd. Suite 230
Las Vegas NV 89119

- i. The updated EMP shall contain the information required to comply with this permit. Preparation of the updated EMP in accordance with *WTS-1B: General Criteria for Preparing an Effluent Management Plan* is recommended.
 - ii. The updated EMP shall include operation and maintenance procedures for the use and operation of the irrigation systems, including storage ponds.
 - iii. Copies of documentation used for purposes of hazard notification to grounds keepers, contractors, or exposed personnel shall be included in the updated EMP.
 - iv. The updated EMP shall include a description of sampling and analysis procedures for monitoring requirements specified as a condition of this permit.
- Within 60 days of permit issuance (Month XX, 2007), the Permittee shall submit current cross-connection control documentation required by Part I.A.15. of the permit and annually thereafter, due with the fourth quarter report. The cross-connection control inspection, including the annual shut down tests for the permitted site shall be conducted by an American Water Works Association Certified Cross-connection Control Specialist in conjunction with the City of Las Vegas Utility Services Department staff.
 - Within 180 days of permit issuance (Month XX, 2007) the Permittee shall submit a Technical Evaluation compiling and interpreting the array of data available from groundwater monitoring;

nitrogen budget analysis, i.e. consumptive use estimations, hydraulic loading, and nutrient uptake; irrigation practices; and any other factors that may impact constituent loading to groundwater. This consolidated evaluation is required to comprehensively assess on-site conditions and how those conditions do or do not affect groundwater. If conditions are found to be impacting groundwater, remedial measures must be proposed. If on-site conditions are not concluded to be impacting groundwater, then a clear interpretation of circumstances negating groundwater impact must be defined.

Schedule of compliance submittals and evidence of compliance documents must be submitted to:

Nevada Division of Environmental Protection
Bureau of Water Pollution Control
901 S. Stewart Street, Suite 4001
Carson City, Nevada 89701
Attn: Compliance Coordinator

PROPOSED DETERMINATION:

The Division has made the tentative determination to issue (renew) the proposed permit, under the provisions prescribed, for a 5-year period. Under NAC 445A.232, this permit is classified as a *Discharge of Treated Effluent for Irrigation - 1,000,000 gallons or more but less than 10,000,000 gallons daily*.

PROCEDURES FOR PUBLIC COMMENT:

Notice of the Division's intent to issue a permit authorizing the facility to discharge to groundwater of the State of Nevada, subject to the conditions contained within the permit, is being sent to the **Las Vegas Review Journal** for publication. Notice is also mailed to interested persons on our mailing list. Anyone wishing to comment on the proposed permit can do so in writing for a period of 30 days following the date of the public notice, and must be postmarked, faxed, or e-mailed by 5:00 p.m. on **August 13, 2007**. The comment period can be extended at the discretion of the Administrator. A public hearing on the proposed determination can be requested by the Applicant, any affected State, any affected interstate agency, the Regional Administrator, or any interested agency, person, or group of persons. The request must be filed within the comment period and must indicate the interest of the person filing the request and the reason(s) why a hearing is warranted. Public hearings granted by the Division are conducted in accordance with NAC 445A.238. The final determination of the Administrator may be appealed to the State Environmental Commission pursuant to NRS 445A.605.

Prepared by:

James T. Hogan
July 10, 2007

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