

DRAFT
NEVADA DIVISION OF ENVIRONMENTAL PROTECTION
FACT SHEET
(pursuant to NAC 445A.236)

Permittee: Las Vegas Sands, Inc.
3355 Las Vegas Boulevard South
Las Vegas, Nevada 89109

Permit: NV0022888 – Renewal

Location: The Venetian Casino Resort
3355 Las Vegas Boulevard South
Las Vegas, Clark County, Nevada 89109

Latitude: 36° 07' 21"N [36.1225000°], Longitude: 115° 10' 13"W [-115.1702778°]
Township 21S, Range 61E, Section 16 MDB&M

General: The Permittee operates the Venetian Casino Resort, at 3355 Las Vegas Boulevard South in Las Vegas, Clark County, Nevada and has applied for a National Pollutant Discharge Elimination System (NPDES) permit renewal to extend the authorization to discharge a 30-day average of 0.864 million gallons per day (MGD) of treated and untreated groundwater to the Las Vegas Wash via the Clark County stormdrain system and the Flamingo Wash. This facility includes three permanent sub-level dewatering systems with six outfalls.

The discharge of Phase I construction dewatering water was authorized under temporary permit TNEV97005. Permit NV0022888 was originally issued in February 1998, was renewed in May 2003, and modified in September 2005 to include Palazzo - North Tower dewatering discharge water.

In 1996, the Permittee's environmental consultant conducted a Phase II Environmental Assessment to investigate the extent of groundwater contamination at the site. The groundwater contamination was determined to consist of at least two plumes of dissolved-phase hydrocarbons in the gasoline range with contaminant concentrations varying across the southwest portion of the site. Contamination in soil and groundwater was limited to soils and water encountered above the caliche layer at the site. During the preconstruction subsurface investigation, no contamination source was identified on the site. Several areas of contaminated soil were discovered during construction.

The original dewatering system consists of a series of French drains that encircle the 1997 construction. This water is collected in three concrete groundwater collection sumps. The flow rate from the original dewatering system is determined from totalizing flow meters on the discharge lines from two of the sumps, one and three, and estimating the flow from the second sump. All three sumps are evacuated with two submersible pumps. The 12,000-gallon first sump is located in the hotel tower basement. This sump is evacuated to a remediation system, Outfall 001. The second sump is located at the casino receiving dock, Outfall 003. The discharge rate from this sump is determined by the pump capacity and operating cycle. The third sump is located in the parking garage valet parking tunnel and collects stormwater, as well as groundwater, Outfall 004. The water collected in sumps two and three is discharged without treatment.

Due to the presence of volatile organic compounds (VOCs) and dissolved-phase hydrocarbons, gasoline, in the shallow groundwater recovered in the first collection sump, this water is treated in an air stripper. The water is pumped through one of three parallel 100-micron sediment filters to remove particulates. The water then travels through one of the two flow meters to the parallel aeration units. Two 300-cubic feet per minute blowers inject air at the bottom of the aeration units, facilitating volatilization of dissolved hydrocarbons and VOCs. From the aeration units, the water is pumped to a storage tank and discharged into the storm drain. The

treatment system was not designed with a bypass for the water. The treatment system is powered by electricity and will shut down with no further discharge in the case of power failure. Prior to the raising of the pH permit discharge limitation, vinegar was added to the first sump to lower the pH below 7.8 standard units (SU). Currently, no chemicals are used in the water treatment system.

In 2001, the Permittee began construction of the Guggenheim Hermitage Museum (in 2010, The Phantom of the Opera Theater) on the property and encountered groundwater at 23 feet below ground surface (bgs). This required the construction of a second dewatering system. In August 2001, the NPDES permit was modified to include the discharge of untreated, museum dewatering groundwater, Outfall 002, without increasing the permitted daily maximum discharge. As-built drawings of the museum dewatering system and the revised Operations and Maintenance (O&M) Manual were approved in January 2004. In August 2008, the permittee installed treatment controls at Outfall 002 to address exceedance of permit limits, principally for lead. The installed system remains active in treating groundwater collected at this sump.

In early 2004, a new source of influent water was added to Outfall 001, the discharge from the groundwater treatment system located on the basement level of the South Tower (Phase I). The additional water originates from sumps in a power vault and an emergency power vault located near the Convention Center (Phase IIA). In 2003, low concentrations of Methyl t-butyl ether (MTBE) were detected in the water from both vaults and 1,1,2,2 Tetrachloroethane was detected in the emergency power vault. Although a 2004 water sample from a pit upgradient of the vaults was analyzed with no VOCs detected, this groundwater is processed through the air stripper system. The new source of water did not require permit modification because the groundwater is processed through the existing treatment system without an increase of the 30-day average flow limitation.

The 50-story Palazzo-North Tower includes approximately 3,025 hotel rooms, 80,000 square feet of casino, a four-story subterranean parking garage, nine roof top pools, retail shopping, and the third permanent sub-level dewatering system. This dewatering system includes four groundwater collection sumps in the North Tower parking garage. The 560-gallon GSP-1-E sump collects uncontaminated groundwater from below the caliche layer and a portion of the garage stormwater runoff. Secant walls were installed as structural components of the sublevel structure of the North Tower. The secant walls have been designed to limit the amount of groundwater infiltration through the walls. The 360-gallon GSP-2-E sump has been designed to collect the secant wall seepage. The 560-gallon GSP-3-E sump collects a portion of the structure under slab drain water. The 1,615-gallon GSP-4-E sump collects the remainder of the subdrain water and the garage stormwater.

Depending on the water quality of groundwater collected at the GSP-2-E sump, water is discharged directly to the Las Vegas Blvd. storm drain (Outfall 005) or, if treatment is necessary, it is routed to the South Tower air stripper (Outfall 001) before discharging. The groundwater collected at the North Tower sump GSP-3-E (Outfall 007) and sump GSP-4-E (Outfall 008) do not require treatment and flow is routed to the storm drain system. When North Tower construction activities finished, the temporary dewatering system GSP-1-E (Outfall 006) was eliminated from monitoring requirements that were in previous permits during the North Tower construction period.

Flow: The flow into the collection sumps depends on the depth to groundwater in the Las Vegas Valley water table aquifer system and the amount of precipitation. The water table varies in depth from zero to 50 feet below ground surface.

The 30-day average flow discharge limitation, 0.864 MGD, is a conservative value based on the sum of the capacities of the dewatering systems as requested by the permittee. Once the dewatering system is in place on the property, this value will be the sum of up to six outfalls potentially discharging from the property.

Receiving Water Characteristics: Groundwater from the property dewatering systems is discharged to the Clark County stormdrain system on Las Vegas Boulevard and Sands Avenue. The storm drain conveys the

water to the Upper Las Vegas Wash via the Flamingo Wash. The discharge point for the storm sewer at the Flamingo Wash is located near the intersection of Desert Inn Road and McLeod Drive. Water quality standards for the Upper Las Vegas Wash are specified in NAC 445A.199.

The beneficial uses of the Upper Las Vegas Wash, as designated in NAC 445A.198, are propagation of aquatic life, excluding fish; propagation of wildlife; irrigation; recreation not involving contact with water; maintenance of a freshwater marsh; and watering of livestock.

Drinking Water Protection: Wellhead Protection Areas (WHPA) have not been established for this Las Vegas metropolitan area. The permitted facility property does not lie within a Drinking Water Protection Area (DWPA) 6,000 foot radius buffer zone established for Public Water System (PWS) wells. Groundwater collected and treated by the facility's approved treatment system then discharged, in accordance with permit limitations, to the Clark County stormdrain and entering the Las Vegas Wash is not expected to adversely impact PWS wells in the area.

Corrective Action Sites: This Bureau of Water Pollution Control (BWPC) permit facility is also an active Bureau of Corrective Action (BCA) facility site # 8-001467. Final groundwater and soil remediation activities for the property shall be addressed in accordance with BCA requirements. The permittee reports to BCA results of samples taken from nine monitoring wells located on or near the facility property. There are 5 additional BCA facility sites within a 1 mile radius of this BWPC permit facility. All are associated with cleanup of petroleum hydrocarbons due to leaking underground storage tanks (USTs) or of volatile organic solvents due to dry cleaning operations discharge. Case officers for these potentially affected BCA facility sites were contacted during permit renewal development. No adverse impact is expected to any of the BCA activities due to the permittee operating groundwater treatment systems at this permitted facility location.

Discharge Characteristics: The discharge consists of treated groundwater from the collection/interception and separation process. The following permit excursions were identified during the last permit cycle.

Parameter	Unit	Permit Limit	Sample Location	Sample (Sample date)
Lead	µg/l	.015	Outfall 002	.034 (2/06); .260 (5/06); .070 (11/07); .030 (2/08)
			Outfall 003	.064 (2/06); .140 (2/08)
			Outfall 004	.040 (2/08)
MTBE	µg/l	20	Outfall 001	33 (3/06); 44 (4/06)
Total Petroleum Hydrocarbons [TPH]	mg/l	1.0	Outfall 002	1.2 (5/06); 41 (2/08)

The permittee provided explanation of the excursions to the satisfaction of NDEP and submitted plans to upgrade select treatment processes or controls where necessary to achieve the permit limits. The permittee's submitted upgrade plans and updated O&M manual for the dewatering system were approved by the Division in May 2008. By September 2008, the permittee completed improvements and upgrading the treatment processes on the property to address the permit limit excursions identified by BWPC compliance review. During the period from October 2008 through December 2009, the following table summarizes discharge characteristics reported for the eight outfalls sampled at the facility.

Parameter	Unit	Permit Limit	Min	Avg	Max
Flow, sum	30 day avg.	MGD	0.01066	0.01942	0.06152
Total Ammonia as N, sum	lb/day	1	0	0.00112	0.00576

Parameter	Unit	Permit Limit	Min	Avg	Max
Total Phosphorous [TP], sum	lb/day	1	0	0.00072	0.003293
pH	SU	6.5 - 9.0	6.51 ⁽⁸⁾	--	8.63 ⁽⁷⁾
Total Dissolved Solids [TDS]	mg/l	M&R	680 ⁽²⁾	--	2136 ⁽⁴⁾
Total Inorganic Nitrogen as N [TIN-N]	mg/l	20	0.32 ⁽³⁾	--	12.95 ⁽⁸⁾
Lead	mg/l	0.015	--	--	< 0.015
Aluminum	mg/l	M&R	< 0.050	--	0.640 ⁽²⁾
Manganese	mg/l	M&R	< 0.010 ⁽²⁾	--	0.500 ⁽³⁾
Sludge @ Manhole on Harrah's Dr	visual	M&R	--	--	none
Total Petroleum Hydrocarbons [TPH]	mg/l	1.0	--	--	< 1.0
Benzene	µg/l	5		--	5.2 ^{(7)**} ND @ 4
Toluene	µg/l	100		--	ND @ 5
Ethyl benzene	µg/l	100		--	ND @ 5
Xylenes, Total	µg/l	200		--	ND @ 5
MTBE	µg/l	20		--	ND @ 5
VOC [method 8260 panel] Reporting Limit (RL) varies	µg/l	M&R		--	ND @ RL

ND = non-detect at analysis reporting limit (RL).

A parenthetical superscript denotes the outfall location (1 to 8) where the sample was obtained.

**Benzene exceedance 5.2 µg/l sampled 12/15/09; follow up sample 12/28/09 was non-detect at < 4 µg/l.

MGD: Million gallons per day lb/day: Pounds per day. SU: Standard Units
 mg/L: Milligrams per liter µg/L: Micrograms per liter MTBE: Methyl tert-butyl ether
 VOC: Volatile organic compounds

Proposed Effluent Limitations: Effluent samples taken in compliance with the monitoring requirements specified below shall be taken from:

- i. the sample port on the discharge line from the treatment system, Outfall 001 [include sump GSP-2-E flow if the collected groundwater at that location requires treatment];
- ii. the discharge from The Phantom of the Opera Theater (formerly, the Guggenheim Hermitage Museum) dewatering, Outfall 002;
- iii. the discharge from the casino receiving dock sump, Outfall 003;
- iv. the discharge from the parking garage valet parking tunnel sump, Outfall 004;
- v. the manhole located on Harrah's Drive approximately 100 feet west of Koval Lane;
- vi. the discharge from the North Tower deep aquifer and parking garage stormwater sump GSP-2-E, Outfall 005 [when groundwater does not require treatment];
- viii. the discharge from the North Tower subdrain sump GSP-3-E, Outfall 007; and
- ix. the discharge from the North Tower subdrain system and parking garage stormwater sump GSP-4-E, Outfall 008.

Note: In accordance with footnote 4 of the permit discharge limitations table for the 2005 major modification of permit NV0022888, sample monitoring at Outfall 006 (vii) was discontinued with completion of the North Tower construction eliminating the temporary dewatering activity. Monitoring for sump GSP-2-E is conducted at Outfall 001 if the collected sump groundwater requires treatment. The monitor location designations (i – ix) are retained in the 2010 permit for continuity of record and possible sample analysis activity.

Table 1: Discharge Limitations

PARAMETER	DISCHARGE LIMITATIONS		MONITORING REQUIREMENTS*		
	30-Day Average	Daily Maximum	Sample Location	Measurement Frequency	Sample Type
Flow, MGD	Monitor and Report		i, ii, iii, iv, vi, viii, ix	Monthly	Flow Meter Calculation
	0.864	---	∑ (i, ii, iii, iv, vi, viii, ix)		Calculation
TPH [EPA Method 8015B] (extractable and purgeable), mg/L	---	1.0 ²	i, ix	Monthly ¹	Discrete
			ii, iii, iv, vi, viii	Quarterly	
VOC [EPA Method 8260B] (report all parameters), µg/L	---	Monitor & Report	i, ii, iii, iv, vi, viii, ix	Annually ³	Discrete
Benzene	---	5 ²	i	Monthly ¹	Discrete
Toluene	---	100 ²			
Ethylbenzene	---	100 ²			
Total Xylenes	---	200 ²			
MTBE	---	20 ²			
Total Dissolved Solids, mg/L	Monitor & Report		i, ii, iii, iv, vi, viii, ix	Quarterly	Discrete
Total Inorganic Nitrogen - N, mg/L	---	20.0	i, ii, iii, iv, vi, viii, ix	Quarterly	Discrete
Total Ammonia - N, lb/day	< 1.0		∑ (i, ii, iii, iv, vi, viii, ix)	Quarterly	Calculation
pH, SU	6.5 ≤ pH ≤ 9.0		i, ii, iii, iv, vi, viii, ix	Quarterly	Discrete
Total Phosphorus - P, lb/day	< 1.0		∑ (i, ii, iii, iv, vi, viii, ix)	Quarterly	Calculation
Aluminum, mg/L	Monitor & Report		i, ii, iii, iv, vi, viii, ix	Annually ³	Discrete
Lead, mg/L	---	0.015	i, ii, iii, iv, vi, viii, ix	Quarterly	Discrete
Manganese, mg/L	Monitor & Report		i, ii, iii, iv, vi, viii, ix	Annually ³	Discrete
Presence of Sludge or Bottom Deposits	Monitor & Report		v	Weekly	Visual

* Locations with no discharge during a measurement frequency shall be reported as a visual inspection on Discharge Monitoring Reports. If there is no discharge at a sampling location during a measurement frequency, neither parameter sampling nor analysis is required.

1. After an upset, or an unscheduled shutdown due to system failure, the measurement frequency shall be once within the first 24 hours of startup with a 24-hour lab turnaround and reporting; weekly for three weeks with a 72-hour turnaround and reporting; and monthly thereafter with quarterly reporting.
2. If the discharge exceeds permit limits, the system shall be corrected and adjusted within 24 hours. The discharge shall be re-sampled within 48 hours to confirm that the system is functioning properly and meeting permit limitations.
3. To be sampled in the fourth quarter and submitted to the Division with the Annual Report.

MGD: Million gallons per day.

-N: As nitrogen.

TPH:	Total petroleum hydrocarbons.	SU:	Standard units.
mg/L:	Milligrams per liter.	-P:	As phosphorus.
µg/L:	Micrograms per liter.	VOC:	Volatile organic compounds.
lb/day	Pounds per day.	MTBE:	Methyl tert-butyl ether.

Rationale for Permit Requirements: Monitoring requirements for the parameters specified in Table 1 above have been established to ensure that the receiving water, the Las Vegas Wash, is not degraded as a result of the Permittee's dewatering discharges.

Due to the variability of the quality of the discharges, as documented by the discharge monitoring reports, monitoring of the property's sumps' discharges will continue with the permit renewal. Due to concerns about the migration of additional contaminant plumes on to the Permittee's property, quarterly TPH and annual VOC characterization discharges are included in the permit. The Division's Bureau of Corrective Actions receives and tracks water quality data gathered from monitoring wells on and near by the property.

Flow: The rationale for the daily maximum discharge was explained in the Flow section of this fact sheet.

Total Petroleum Hydrocarbons (TPH): The shallow groundwater in the vicinity of the hotel tower was contaminated by at least two hydrocarbon plumes that migrated on to the site. The renewal permit proposes to continue to monitor TPH with a 1.0 mg/L discharge limitation.

Volatile Organic Compounds (VOC): The shallow groundwater on the property has been impacted by plumes of hydrocarbons containing VOCs. The VOCs that have been detected in the treatment system influent are listed in Table 1 and will be reported quarterly. The renewal permit proposes to continue to monitor VOCs annually.

Total Dissolved Solids (TDS): NAC 445A.199 includes a single value at 180°C TDS standard for beneficial uses of $\leq 3,000$ mg/L. The discharge has met this standard every monitoring. The shallow groundwater with naturally occurring elevated TDS levels would flow to the Wash, if it was not intercepted by the dewatering system, therefore, the TDS standard is not applied to dewatering discharges in this area.

This permit is for the interception and passage of groundwater and thus is exempted under the Colorado River Basin Salinity Control Forum's policy on groundwater interception. The renewal permit proposes to continue to monitor TDS without discharge limitation.

Total Inorganic Nitrogen as Nitrogen (TIN): NAC 445A.199 includes a requirement to maintain existing higher quality TIN standard of 95% of the samples ≤ 20.0 mg/L. The renewal permit proposes to continue to monitor TIN with a 20.0 mg/L discharge limitation.

pH: NAC 445A.199 includes a single value pH water quality standard for beneficial uses within the range of 6.5 – 9.0 SU. The renewal permit proposes to continue to monitor pH without change to the discharge limitation.

Total Ammonia as Nitrogen: A total ammonia TMDL of 970 lb/day has been established for the Las Vegas Bay/Wash. Based on the low concentrations of total ammonia in groundwater and the State's de minimis policy of exempting discharges of less than 1.0 lb/day total ammonia from the TMDL analysis, the total ammonia load is not expected to be an issue. The renewal permit proposes to continue to monitor total ammonia with a <1.0 lb/day discharge limitation.

Total Phosphorus as Phosphorus (TP): In 1987, a TP total maximum daily load (TMDL) of 434 lb/day was established for the Las Vegas Bay/Wash. The waste load allocations (WLAs) set are applicable for only April through September and were based on a target concentration of 0.64 mg/L. WLAs have been assigned only to

the Cities of Las Vegas and Henderson and the Clark County Water Reclamation District.

Based on the State's de minimis policy of exempting discharges of less than 1 lb/day TP from the TMDL analysis, a WLA has not been assigned to this permittee. The renewal permit proposes to continue to monitor total phosphorus with a discharge limitation of <1.0 lb/day.

Aluminum: The monitoring of aluminum was added to the 2005 issued permit because the 2001 permit application listed an aluminum concentration of 0.26 mg/L in the Outfall 002 discharge. The US EPA secondary drinking water standard for aluminum is 0.05 to 0.2 mg/L. The renewal permit proposes to continue to monitor aluminum without discharge limitation.

Lead: The monitoring of lead was added to the permit because the 2001 permit modification application listed a lead concentration of 0.11 mg/L in the Outfall 002 discharge. The primary drinking water standard for lead is 0.015 mg/L. Lead continued to be detected periodically in excess of the permit limitation at Outfall 002. The permittee installed additional treatment measures for Outfall 002 and they were put into service by September 2008 to meet the permit limit. Analyses subsequent to applying the additional treatment measures, the discharges have met the permit limits. The renewal permit proposes to continue to monitor lead with a 0.015 mg/L discharge limitation.

Manganese: The monitoring of manganese was added to the permit because the October 1997 permit application listed a manganese concentration in the discharge of 0.25 mg/L. NAC 445A.144 sets a manganese concentration discharge limit of 0.20 mg/l for the irrigation beneficial use. The renewal permit proposes to continue to monitor manganese without discharge limitation.

Remediation Activities and Special Conditions: Groundwater and soil remediation activities shall be addressed in accordance with requirements of the Division's Bureau of Corrective Actions. The Permittee shall notify the Division's Bureau of Water Pollution Control in writing when the Permittee is granted approval from the Bureau of Corrective Actions to cease operation of the groundwater extraction and treatment system.

Schedule of Compliance: The Permittee shall implement and comply with the provisions of the schedule of compliance after approval by the Administrator, including in said implementation and compliance, any additions or modifications that the Administrator may make in approving the schedule of compliance.

- The Permittee shall maintain and revise, as necessary, the Operations and Maintenance (O&M) manual sections for the site keeping all information current. Within 60 days of permit being issued, **Month Day, 2010**, the permittee shall:
 - i. Submit a letter to the Division indicating that the approved O&M manual has not changed since the last Division approval and that the manual is still valid for the treatment system(s) operation at the site;
 - OR**
 - ii. Submit an updated O&M manual for the site treatment system(s) for review and approval by the Division. The submitted O&M manual or sections therein shall include any change made to the treatment system since the last Division approved edition needed to comply with this permit as issued.
- The permittee shall notify the Division in writing within 14 days of the permittee being granted approval to cease operation of the groundwater extraction and remediation treatment system from the agency having corrective action jurisdiction of the permitted facility (see permit Part I.A.2).

Proposed Determination: The Division has made the determination to issue the proposed permit for a five-year (5) period.

Procedures for Public Comment: The Notice of the Division's intent to issue the permit authorizing the facility to discharge to the 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. The notice is being mailed to interested persons on the NDEP-BWPC 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 publication of the public notice. All comments must be received by 5:00 pm local time on October 4, 2010. 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 reasons why a hearing is warranted.

Any public hearing determined by the Administrator to be held must be conducted in the geographical area of the proposed discharge or any other area the Administrator determined to be appropriate. All public hearings must be conducted to 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: E. Samuel Stegeman, P.E.
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