

**NEVADA DIVISION OF ENVIRONMENTAL PROTECTION**

**FACT SHEET**

(pursuant to NAC 445A.236)

**Permittee:** Nevada Department of Wildlife  
1100 Valley Rd,  
Reno, NV 89512

**Permit Number:** NV0020192

**Project:** Lake Mead Hatchery

**Description of Discharge:** Hatchery flow through water drawn from Lake Mead is discharged into an unnamed natural drainage and enters Lake Mead (Colorado River). The facility site is approximately 4.5 miles southeast from confluence of the Las Vegas Wash into Las Vegas Bay and two miles north of Boulder Beach.

Location: Lake Mead State Fish Hatchery  
245 Lakeshore Drive  
Boulder City, (Clark County) Nevada

|   |                   |                   |                           |                 |
|---|-------------------|-------------------|---------------------------|-----------------|
| Sec 34: SW4-SW4                         | Township 21 South | Range 64 East     | Mt Diablo Base & Meridian |                 |
| FEATURE                                 | LAT (d m s)       | LON (d m s)       | LAT (decimal °)           | LON (decimal °) |
| Nv Dept Of Wildlife, Lake Mead Hatchery | 36° 04' 52.75" N  | 114° 49' 14.75" W | 36.0813194°               | -114.8207639°   |

**General Description and Discharge Location:** The Lake Mead Fish Hatchery has been in operation since 1972. It has undergone facility reconstruction and was out of production from May 2003 to April 2005. Recently, the 2007 infestation of quagga mussels in Lake Mead has necessitated additional operational safeguards for the facility, resulting in limited production to 1,000 pounds or less annually of non-trout fish species. This minimal non-trout production level is expected to be in place until at least 2013 when appropriate remedies and protections could be in place to resume trout production activities. The hatchery is a cold water facility typically rearing about 180,000 to 200,000 pounds of fish each year. The hatchery's maximum hatchery production of fish since beginning operation is approximately 230,000 pounds.

Water for the Hatchery is delivered from the Basic Management Incorporated (BMI) pipeline which intakes Lake Mead water from an elevation at 1060 feet mean sea level (msl) at a depth ranging from 30 feet to 170 feet below the water surface. The maximum operational level of Lake Mead is 1229 feet [msl], with the current [December 2009] level at 1,095 feet msl. The permittee is negotiating with the Southern Nevada Water Authority (SNWA) to have Lake Mead water delivered to the facility from SNWA intakes. Depending on lake level, SNWA operates intakes at 1050 feet msl and 1000 feet msl, with a future one planned at 860 feet msl. The lake water is aerated to raise the dissolved oxygen level to saturation. It is then disinfected by ultra violet lamps and introduced into the hatchery basins. Fish are raised in a series of rearing channels, being fed dry fish food products having varying concentrations of nitrogen, phosphorus and other food nutrients.

Water passes through the series of rearing basins and is discharged to a concrete settling basin after passing through a rotary micro-filtration drum filter. The effluent from this settling basin is discharged into a vegetated natural drainage which transports the water to Lake Mead. There is continuous water flow for the length of the drainage.

|                                     |                  |                   |                   |                   |
|-------------------------------------|------------------|-------------------|-------------------|-------------------|
| FEATURE                             | LAT (d m s)      | LON (d m s)       | LAT (decimal deg) | LON (decimal deg) |
| 001 Outfall Settling Pond Discharge | 36° 04' 55.10" N | 114° 49' 11.15" W | 36.0819722°       | -114.8197639°     |
| Release at Parshall Flume           | 36° 04' 53.80" N | 114° 49' 08.35" W | 36.0816111°       | -114.8189861°     |

**Flow:** Discharge rates from the settling basin to the drainage will vary depending on hatchery activities. The 30-day average flow rate during typical production levels is historically about 5.0 million gallons per day (mgd), but allowance for peak flow up to 7.0 mgd is authorized for times during the year when the hatchery is at high productivity. This increased flow need routinely falls during the months of July through September each year, when fish rearing activity is highest. Higher flows are used to deliver sufficient amounts of dissolved oxygen to the fish thus

minimizing health stresses. Following 2004 reconstruction, entraining liquid oxygen into water delivered to the rearing basins now reduces dependence for peak flow delivery needed for relieving stress conditions.

**Receiving Water Characteristics:** Water discharged from the settling basin releases into a vegetated natural drainage that enters Pumphouse Cove in the Boulder Basin of Lake Mead. The facility discharging to receiving waters named in this permit is regulated in part by Chapter 445A in the Nevada Administrative Code (NAC) setting controls of water quality standards and criteria as adopted by the State Environmental Commission (SEC) to protect specified waterbody beneficial uses. NAC 445A sections used in permit development include:

| Permit Receiving Water Name | Waterbody Controls of Water Quality Standards & Criteria per NAC 445A |           |           |                |
|-----------------------------|---|-----------|-----------|----------------|
|                             | Waterbody   | Statewide | Narrative | Beneficial Use |
| Lake Mead (Colorado River)  | 195, 143  | 118, 144  | 121       | 194            |

**Proposed Limitations:** The discharge shall be limited and monitored by the Permittee as specified below: Samples taken in compliance with the below specified monitoring requirements shall be taken at locations as indicated: Discharge Outlet of the settling basin (D); or Intake Water to hatchery (I); Release flow measurement flume (M); or Pumphouse Cove: at natural drainage confluence with Cove (P<sub>C</sub>) and a point into Cove (P<sub>C1</sub>) past the confluence.

**TABLE I.1 – DISCHARGE LIMITATIONS**

| <u>PARAMETER</u>   |                  | <u>DISCHARGE LIMITATIONS</u>                        |  | <u>MONITORING REQUIREMENTS <sup>1</sup></u>              |                       |             |
|--|------------------|---|--|--|-----------------------|-------------|
| Concentration units are mg/L unless otherwise indicated.             |                  | 30-Day Average                                      | Daily Max  | Sample Location  | Measurement Frequency | Sample Type |
| <b>Flow <sup>2</sup> (MGD)</b>                                       |                  | Q <sub>P</sub> <sup>2</sup>                         | 7.0  | I  | Monthly               | Meter       |
| <b>Total Dissolved Solids<sup>3</sup> Intake</b>                     |                  | Monitor & Report = TDS <sub>I</sub>                 |  | I  | Quarterly             | Discrete    |
| <b>Total Dissolved Solids<sup>3</sup></b>                            | <b>Discharge</b> | M&R = TDS <sub>D</sub>                              | 1,000  | D  | Quarterly             | Composite   |
|  | <b>Discharge</b> | (TDS <sub>D</sub> - TDS <sub>I</sub> ) ≤ 100        | --   | I, D   | Quarterly             | Calculate   |
| <b>Chlorides <sup>3</sup></b>  |                  | Monitor & Report                                    | 400  | D  | Quarterly             | Composite   |
| <b>Sulfate <sup>3</sup></b>  |                  | Monitor & Report                                    | 500  | D  | Quarterly             | Composite   |
| <b>Total Suspended Solids</b>  |                  | Monitor & Report                                    | 25   | D  | Monthly               | Composite   |
| <b>Total Inorganic Nitrogen</b>                                      |                  | ≤ 4.5 <sup>8</sup>                                  | 4.5  | D  | Monthly               | Composite   |
| <b>Total Ammonia as N <sup>4</sup></b>                               |                  | Footnote 4A   | Footnote 4B  | D  | Monthly               | Discrete    |
| <b>Dissolved Oxygen <sup>5</sup></b>                                 |                  | ≥ 5.0   |  | D, M   | Monthly               | Discrete    |
| <b>Total Phosphorus as P</b>   |                  | Monitor & Report                                    |  | D  | Quarterly             | Composite   |
| <b>pH (S.U.)</b>   |                  | ≤ 8.8 <sup>8</sup>                                  | 6.5 to 9.0   | D  | Monthly               | Discrete    |
| <b>Temperature<sup>6</sup> (°C)</b>                                  | <b>Location</b>  | Monitor & Report = T <sub>C</sub> , T <sub>C1</sub> |  | P <sub>C</sub> , P <sub>C1</sub>                         | Monthly               | Discrete    |
|  | <b>Change</b>    | (T <sub>C</sub> - T <sub>C1</sub> ) ≤ 2.0           |  | P <sub>C</sub> , P <sub>C1</sub>                         | Monthly               | Calculate   |
| <b>Fecal Coliform (MPN) per 100 ml</b>                               |                  | ≤ 200   |  | D  | Monthly               | Discrete    |
| <b>Drugs <sup>7</sup>: INAD &amp; extralabel</b>                     |                  | Monitor & Report                                    |  | Report per 40 CFR 451.3.                                 |                       |             |
| °C: Degrees Celsius [temperature]<br>mg/L: Milligrams per Liter: ppm |                  | ml: milliliter<br>M & R: Monitor and Report         | MGD: Million Gallons per Day<br>SU: Standard Units | MPN: Most Probable Number<br>TDS: Total Dissolved Solids |                       |             |

- See Part I.B. of permit for additional information on sampling, testing, reporting, monitoring and definitions related to requirements.
- The provisional flow rate (Q<sub>P</sub>) for permit compliance shall be established in accordance with permit Part I.A.4. Historic hatchery production data shows flow is typically about 5.0 MGD, but flows up to 7.0 MGD may be required for production at times from July through September. When flows are greater than 5.0 MGD, monitoring frequency shall be increased to semi-monthly.
- Salinity loading by Nevada facility dischargers in the Colorado River Basin is subject to NAC 445A.143 criteria as a group such that the flow weighted annual average measured below Hoover Dam shall be ≤ 723 mg/L and is reported by the Colorado River Basin Salinity Control Forum. Forum policy for fish hatcheries allow a 100 mg/L increase above the measured mg/L concentration of Colorado River intake water.
- For each sample event, formula terms contained in A and B below shall have the following meaning: **pH and T are field measurements of facility discharge** taken at the same time and location as the water sample destined for the laboratory analysis of ammonia.
  - The chronic criteria of water quality with regard to the concentration of total ammonia are subject to the following:
    - The facility discharge Monthly chronic concentration of total ammonia, in milligrams of nitrogen per liter, shall be calculated by the NAC 445A.118 Table 2 chronic concentration by **value from table matrix of temperature and pH or by formula** for the 30-Day

average for each discharge sample event as follows: 
$$\left[ \frac{0.0577}{1 + 10^{7.688 - pH}} \right] + \left[ \frac{2.487}{1 + 10^{pH - 7.688}} \right] \times \text{MIN} [2.85, 1.45 \times 10^{0.028 \times (25 - T)}]$$

where: *MIN* = lesser of comma separated values; *T* = temp. Celsius deg.; *x* = multiply

- (b) The concentration of total ammonia, in milligrams of nitrogen per liter, expressed as a 30-day average must not exceed the applicable chronic criterion as calculated more than once every 3 years on average, and the highest 4-day average within the 30-day period must not exceed 2.5 times the applicable chronic criterion.

**Measurement frequency** of once per 30-day (Monthly) is an acceptable indicator for evaluating total ammonia chronic criterion and may be used in reporting to demonstrate compliance of discharge event calculated limit. However, if a sample analysis exceeds the allowed calculated chronic limit in part (a), the **measurement frequency** must be increased to a minimum of 4 consecutive days within the 30-day period so that chronic criterion part (b) can be applied for determining permit compliance.

B. The acute criteria for water quality with regard to the concentration of total ammonia are subject to the following:

- (a) The facility discharge Daily Maximum acute concentration of total ammonia, in milligrams of nitrogen per liter, for **warm water fisheries** shall be calculated by the NAC 445A.118 Table 1 acute concentration by **value from table matrix of pH and fishery water type or by formula** for the 1-hour average for each sample event as follows: 
$$\left[ \frac{0.411}{1 + 10^{7.204 - pH}} \right] + \left[ \frac{58.4}{1 + 10^{pH - 7.204}} \right]$$

- (b) The concentration of total ammonia, in milligrams of nitrogen per liter, must not exceed the applicable acute criterion as calculated more than once every 3 years on average.

**Measurement frequency** for evaluating total ammonia acute criterion as daily maximum shall utilize the same **measurement frequency** required for that of evaluating the chronic criteria of water quality defined in A above. The total ammonia concentration determined by laboratory analysis for each sample event shall be compared to the same event's calculated acute criterion limit.

5. The Dissolved Oxygen limit can be met at the discharge measure Parshall flume (M) if necessary for flows exceeding 5.0 MGD.
6. For compliance evaluation, the effluent temperature at the hatchery's natural drainage discharge channel confluence (P<sub>C</sub>) with Pumphouse Cove shall be compared to the surface temperature of Pumphouse Cove at a distance of 60 feet into the Cove (P<sub>C1</sub>) past the confluence. The temperature of the point inside the cove shall not be greater than 2° C than that of the confluence point temperature. [(T<sub>C</sub> - T<sub>C1</sub>) ≤ 2.0]
7. Reporting is not required for an investigational new animal drug (INAD) or extralabel drug use of a drug previously approved by FDA for a different aquatic animal species or diseases if the INAD or extralabel use is at or below the approved dosage and involves similar conditions of use. The permittee shall notify the Division of any anticipated use of a drug that will not qualify for non-reporting in accordance with this provision. Following permittee notification to the Division, the permittee shall, for the drug or constituent of concern, meet the concentration limit and the sampling and reporting frequency set by the Division. The permittee shall apply for permit modification if necessary.
8. The permittee is considered to be in compliance when 95% of all samples of the given parameter in the past two years are less than or equal to the set 30-day average limit. When an exceedance of the 30-day average limit occurs, the permittee shall provide an analysis with the DMR submittal for the parameter covering the appropriate past two year time frame to demonstrate whether or not compliance has been achieved by 95% of the parameter samples meeting the set water quality limit.

### **Rationale for Permit Requirements:**

**FLOW** - Based on prior permits, the typical daily capacity flow-through discharge of this facility, when it is not operating at reduced capacity, is 5.0 MGD (Table I.1 footnote 2). A 7.0 MGD permit limit allows for times during the year, typically occurring from July through September, when the hatchery is at peak production capacity. Sampling frequency will be increased to semi-monthly during time periods when flows exceed 5.0 MGD. The set loading limits from the facility may not be exceeded.

While the facility is addressing additional facility refurbishments needed to provide protection from quagga mussel infestation and change over to another water supply purveyor, the facility will be operating at flow levels less than the 5.0 MGD seen historically. The permittee shall be responsible for notifying the Division of an intended operating flow level each year in accordance with permit requirements Part I.A.4. in order to establish the compliance flow limit. The Division will set a provisional flow limit and any requirements for monitoring and/or reporting following review of information provided by the permittee. No provisional 30-day average compliance flow limit shall be set greater than 7.0 MGD unless accomplished either by a major modification or by renewal of this permit.

**TOTAL DISSOLVED SOLIDS**-The daily maximum limit of 1000 mg/l TDS is based on the requirements listed in NAC 445A.195 set to protect designated beneficial uses. The State Environmental Commission (SEC), through NAC 445A.143, has adopted the standards criteria and policy recommended by the Colorado River Basin Salinity Control Forum for addressing TDS loading to the Colorado River. Forum policy allows for an increase concentration of 100 mg/l discharge water over the flow weighted average concentration of intake supply water. For the 30-day average, Permittee will be required to compare the TDS levels in the discharge to the concentration of the intake supply water. If the facility is unable to maintain this allowable increase, the permittee will have to demonstrate to the Division that it is not practicable to meet this goal. The guidelines for this submittal shall follow those published in the Colorado

River Basin Salinity Control Forum policy.

**CHLORIDES**-The daily maximum limit of 400 mg/l is based on the requirements listed in NAC 445A.195. This is the allowed portion of this parameter as part of the 1000 mg/l TDS daily maximum limitation set in the permit. A 30-day average limit for this parameter was not set in past permits and is not set for this permit.

**SULFATE**-The daily maximum limit of 500 mg/l is based on the requirements listed in NAC 445A.195. This is the allowed portion of this parameter as part of the 1000 mg/l TDS daily maximum limitation set in the permit. A 30-day average limit for this parameter was not set in past permits and is not set for this permit.

**TOTAL SUSPENDED SOLIDS**-The daily maximum TSS limit is set at 25 mg/l per the requirements listed in NAC 445A.195. A 30-day average limit for this parameter was not set in past permits and is not set for this permit. The facility has demonstrated substantial compliance with this limit during the past ten years.

**TOTAL INORGANIC NITROGEN**-The daily maximum limit of 4.5 mg/l is based on the requirement listed in NAC 445A.195 set to protect beneficial uses. The 30-day average for total inorganic nitrogen requires that 95% of samples be less than or equal to 4.5 mg/l concentration. The Facility has demonstrated substantial compliance with this limit in the past.

**TOTAL AMMONIA as N**- This limit is based on the requirement listed in NAC 445A.195 to meet provisions for this parameter as listed in NAC 445A.118. Provision is made for meeting a Daily Maximum value (acute concentration) and a 30-Day Average value (chronic concentration). This method for analyzing ammonia is new to this permit and replaces the evaluation of un-ionized ammonia for the protection of aquatic life beneficial use for this receiving waterbody. The facility has not demonstrated any problem with meeting the previous permit limit of 0.03 mg/l for un-ionized ammonia set to be protective for aquatic life. Using the proposed acute and chronic total ammonia concentration criteria to determine protection of aquatic life is as stringent as the previous permit using un-ionized ammonia concentration criteria for the protection of aquatic life beneficial use.

**DISSOLVED OXYGEN**-The daily minimum (level) limit of 5.0 mg/l is based on the requirement listed in NAC 445A.195 set for waterbodies that are warm water fisheries. Compliance with this limit may be attained at the location of the effluent flow measurement flume during periods of high hatchery production from July through September. Permittee shall provide explanation for utilizing this provision and increase monitoring frequency as required by the permit.

**TOTAL PHOSPHORUS as P**-This parameter is being evaluated in the permit on a monitor and report basis with quarterly analysis to assess phosphorus loading to Lake Mead from discharge by this facility.

**pH**-This daily maximum limit of 6.5 to 9.0 S.U. is based on the requirements listed in NAC 445A.195 set to protect beneficial uses. The 30-day average for pH requires that 95% of samples be less than or equal to 8.8.S.U. The facility has demonstrated substantial compliance with this limit in the past.

**TEMPERATURE**- A maximum allowable increase of 2° C to the surface water temperature of the receiving water, Lake Mead, is included in this permit per the requirements listed in NAC 445A.195. The permittee will monitor the effluent temperature at the natural drainage channel's confluence with Pumphouse Cove and compare it to the surface temperature of Pumphouse Cove at a distance 60 feet beyond the confluence. The mixing zone length provides for temperature blending to that of the receiving surface water. The volume of discharge water is relatively small in relation to that of the receiving water; hence, this discharge should not adversely impact the beneficial uses of the receiving water for which this parameter is set to protect.

**FECAL COLIFORM**- The limit of 200 mpn/100 ml is based on the requirement listed in NAC 445A.195.

**DRUGS: INAD & Extralabel**- This limit is based on a US EPA final rule, effective June 30, 2004, addressing effluent guidelines for the aquatic animal production industry and requires that such facilities monitor and report drug use per 40 CFR 451.3. Reporting is not required for an investigational new animal drug (INAD) or extralabel drug use of a drug previously approved by FDA for a different aquatic animal species or diseases if the INAD or extralabel use is at or below the approved dosage and involves similar conditions of use. The permittee shall notify the Division of

any anticipated use of a drug that will not qualify for non-reporting in accordance with this provision. Following permittee notification to the Division, the permittee shall, for the drug or constituent of concern, meet the concentration limit and the sampling and reporting frequency set by the Division. The permittee shall apply for permit modification if necessary.

**Supplemental Permit Conditions:** The recent 2007 infestation of quagga mussels in Lake Mead has necessitated additional operational safeguards for the facility, resulting in limited production for the foreseeable future until appropriate remedies and protections can be put in place. Minor modification to the permit can allow the permittee to modify or alter facility operations and/or equipment, including installing new equipment, to remedy and/or provide protection to operations against invasive mussels or other organisms provided that such action or activity does not result in discharge of pollutants except in accordance with permit limits.

**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.

- a. **Discharge Limits** - Permittee shall achieve discharge limits compliance upon permit issue.
- b. **Operations and maintenance manual** - An updated operations and maintenance (O&M) manual for the facility shall be submitted to NDEP by **July 1, 2010**. Although not limited to, the O&M manual shall:
  - i. Address sludge management practices;
  - ii. Provide a site plan of the refurbished hatchery showing, but not limited to, general flow paths (piping) for routing of pass-through source water and discharge flows; and
  - iii. Incorporate a Best Management Practice (BMP) plan that describes how the facility will function to meet permit requirements per the June 30, 2004, EPA final rule effluent guidelines for the aquatic animal production industry.
- c. By March 31 each year, in accordance with permit Part I.A.4a., the permittee shall notify the Division of the facility's anticipated 30-day average flow rate for the projected time period defined by the State's next upcoming fiscal year cycle (July 1 to June 30). The Division will review the submitted information and set a provisional 30-day average flow rate ( $Q_p$ ) for permit compliance and fee assessment purposes for use during the immediately upcoming July 1 to June 30 time period. The permittee shall notify the Division of any  $Q_p$  exceedance in accordance with permit Part I.A.4.b.

**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 facility falls under the permit category of DISCHARGE FROM A FISH HATCHERY...2,500,000 gallons or more daily.

**Procedures for Public Comment:** Notice of the Division's intent to re-issue a permit authorizing the facility to discharge to waters 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 in the NDEP-BWPC mailing list database. Anyone wishing to comment on the proposed permit can do so in writing up through the noticed comment period date, as designated herein, which must be through a period of at least 30 days following the date of the public notice. All materials being submitted must be hand-delivered, e-mailed, faxed or postmarked no later than 5:00 P.M. PST, or PDT if in effect, on **March 26, 2010**, the close of noticed comment period. 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.

Any public hearing held by the Administrator will be conducted in the geographical area of the proposed discharge or any other area the Administrator determines to be appropriate. All public hearings will be 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: E. Samuel Stegeman, P.E.  
December 2009