NEW MEXICO
ENVIRONMENT DEPARTMENT

Surface Water Quality Bureau

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

Harold Runnels Building, N2050
1190 South St. Francis Drive (87505)
P.O. Box 5469, Santa Fe, NM 87502-5469
Phone (505) 827-0187 Fax (505) 827-0160
www.nmenv.state.nm.us

RYAN FLYNN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

Certified Mail - Return Receipt Requested

October 14, 2014

Mr. Michael Sloane, Chief
New Mexico Department of Game and Fish
Fisheries Division
Post Office Box 25112
Santa Fe, New Mexico 87504

Re: New Mexico Department of Game and Fish, Los Ojos Fish Hatchery; Major; Industrial Individual Permit; SIC 0921; Compliance Evaluation Inspection; NPDES Permit NM0030139; September 25, 2014

Dear Dr. Sloane:

Enclosed please find a copy of the report and check list for the referenced inspection that the New Mexico Environment Department (NMED) conducted at your facility on behalf of the U.S. Environmental Protection Agency (USEPA). This inspection report will be sent to the USEPA in Dallas for their review. These inspections are used by USEPA to determine compliance with the National Pollutant Discharge Elimination System (NPDES) permitting program in accordance with requirements of the federal Clean Water Act.

You are encouraged to review the inspection report, required to correct any problems noted during the inspection, and advised to modify your operational and/or administrative procedures, as appropriate. If you have comments on or concerns with the basis for the findings in the NMED inspection report, please contact us (see the address below) in writing within 30 days from the date of this letter. Further you are encouraged to notify in writing both the USEPA and NMED regarding modifications and compliance schedules at the addresses below:

Racquel Douglas
US Environmental Protection Agency, Region VI
Enforcement Branch (6EN-WM)
Fountain Place
1445 Ross Avenue
Dallas, Texas 75202-2733

Bruce Yurdin
New Mexico Environment Department
Surface Water Quality Bureau
Point Source Regulation Section
P.O. Box 5469
Santa Fe, New Mexico 87502

If you have any questions about this inspection report, please contact Sandra Gabaldon at (505) 827-1041 or at sandra.gabaldon@state.nm.us.

Sincerely,

/s/ Bruce J. Yurdin

Bruce J. Yurdin
Program Manager
Point Source Regulation Section
Surface Water Quality Bureau

cc: Rashida Bowlin, USEPA (6EN-AS) by e-mail
Carol Peters-Wagnon, USEPA (6EN-WM) by e-mail
Racquel Douglas, USEPA (6EN-WM) by e-mail
Gladys Gooden-Jackson (6EN-WC) by e-mail
Tung Tguyen, (6EN-WQ) by email
NMED District II by e-mail

Form Approved
OMB No. 2040-0003
Approval Expires 7-31-85

NPDES Compliance Inspection Report

Section A: National Data System Coding

Transaction Code	NPDES	yr/mo/day	Inspec. Type	Inspector	Fac Type
1 N 2 5 3	N M 0 0 3 0 3 1 9 11	12 1 4 0 9 2 5 17	18 C	19 S 20	1

F	I	S	H		H	A	T	C	H	E	R	Y															

Inspection Work Days	Facility Evaluation Rating	BI	QA	Reserved
67 1 69	70 3	71 N 72	N 73	74 75 80

Section B: Facility Data

Name and Location of Facility Inspected *(For industrial users discharging to POTW, also include POTW name and NPDES permit number)*	Entry Time /Date	Permit Effective Date
NMDGF – Los Ojos Fish Hatchery State Road 84//68; Exit to Hwy 512 (Los Ojos) onto County Road 340, follow signs to hatchery. **RIO ARRIBA COUNTY**	1335 HOURS / 09-25-2014	November 1, 2013
	Exit Time/Date	Permit Expiration Date
	1640 HOURS / 09-25-2014	October 31, 2018

Name(s) of On-Site Representative(s)/Title(s)/Phone and Fax Number(s)	Other Facility Data
Richard Keller, Assistant Manager / (505) 588-7307	SIC: 0921
Name, Address of Responsible Official/Title/Phone and Fax Number Michael Sloane, Division Chief, Fisheries Division NMDG&F Post Office Box 25112 Santa Fe, NM 87504 (505) 476-8055	Contacted Yes [ ] No [*] Outfall 001: 36 43° 09.14 N -106 34° 39.38 W Outfall 002: 36 43°02.08" N -106 34°36.40" W

Section C: Areas Evaluated During Inspection

(S = Satisfactory, M = Marginal, U = Unsatisfactory, N = Not Evaluated)

S	**Permit**	U	**Flow Measurement**	M	**Operations & Maintenance**	N	**CSO/SSO**
M	**Records/Reports**	S	**Self-Monitoring Program**	N	**Sludge Handling/Disposal**	N	**Pollution Prevention**
S	**Facility Site Review**	S	**Compliance Schedules**	N	**Pretreatment**	N	**Multimedia**
S	**Effluent/Receiving Waters**	S	**Laboratory**	N	**Storm Water**	N	**Other:**

Section D: Summary of Findings/Comments (Attach additional sheets if necessary)

Please see checklist and further explanations for details of findings

Name(s) and Signature(s) of Inspector(s)	Agency/Office/Telephone/Fax	Date
Sandra Gabaldon ***/s/ Sandra Gabaldon***	**NMED/SWQB/(505) 827-1041/(505) 827-0610**	**October 14, 2014**
Signature of Management QA Reviewer ***/s/ Michelle Lemon*** **Michelle Lemon, Municipal Team Lead**	**Agency/Office/Phone and Fax Numbers** **NMED/SWQB/(505) 827-2819/(505) 827-0610**	**Date** **October 14, 2014**

NEW MEXICO DEPARTMENT OF GAME AND FISH – LOS OJOS FISH HATCHERY	PERMIT NO: NM0030139

SECTION A - PERMIT VERIFICATION

PERMIT SATISFACTORILY ADDRESSES OBSERVATIONS X S ☐M ☐U ☐NA (*FURTHER EXPLANATION ATTACHED NO)*

DETAILS:

1. CORRECT NAME AND MAILING ADDRESS OF PERMITTEE	X Y ☐N ☐NA
2. NOTIFICATION GIVEN TO EPA/STATE OF NEW DIFFERENT OR INCREASED DISCHARGES	¨ Y ☐N X NA
3. NUMBER AND LOCATION OF DISCHARGE POINTS AS DESCRIBED IN PERMIT	X Y ☐N ☐NA
4. ALL DISCHARGES ARE PERMITTED	X Y ☐N ☐NA

SECTION B - RECORDKEEPING AND REPORTING EVALUATION

RECORDS AND REPORTS MAINTAINED AS REQUIRED BY PERMIT. O S X M ☐U ☐NA (*FURTHER EXPLANATION ATTACHED YES)*
DETAILS: See further explanations for Settleable solids bench sheets. Some required information not provided on bench sheet.
Effluent loading calculations are used as required; however, the flow readings are inaccurate for the broad crested weir.

1. ANALYTICAL RESULTS CONSISTENT WITH DATA REPORTED ON DMRs.	X Y ☐N ☐NA
2. SAMPLING AND ANALYSES DATA ADEQUATE AND INCLUDE.	O S X M ☐U ☐NA
a) DATES, TIME(S) AND LOCATION(S) OF SAMPLING	X Y ☐N ☐NA
b) NAME OF INDIVIDUAL PERFORMING SAMPLING	O Y X N ☐NA
c) ANALYTICAL METHODS AND TECHNIQUES.	O Y X N ☐NA
d) RESULTS OF ANALYSES AND CALIBRATIONS.	X Y ☐N ☐NA
e) DATES AND TIMES OF ANALYSES.	X Y ☐N ☐NA
f) NAME OF PERSON(S) PERFORMING ANALYSES.	O Y X N ☐NA
3. LABORATORY EQUIPMENT CALIBRATION AND MAINTENANCE RECORDS ADEQUATE.	X S ☐M ☐U ☐NA
4. PLANT RECORDS INCLUDE SCHEDULES, DATES OF EQUIPMENT MAINTENANCE AND REPAIR.	X S ☐M ☐U ☐NA
5. EFFLUENT LOADINGS CALCULATED USING DAILY EFFLUENT FLOW AND DAILY ANALYTICAL DATA.	¨ Y X N ☐NA

SECTION C - OPERATIONS AND MAINTENANCE

TREATMENT FACILITY PROPERLY OPERATED AND MAINTAINED. ☐S X M ☐U ☐NA *(FURTHER EXPLANATION ATTACHED YES)*
DETAILS:

1. TREATMENT UNITS PROPERLY OPERATED.	X S ☐M O U ☐NA
2. TREATMENT UNITS PROPERLY MAINTAINED.	☐S X M OU ☐NA
3. STANDBY POWER OR OTHER EQUIVALENT PROVIDED .	X S ☐M O U ☐NA
4. ADEQUATE ALARM SYSTEM FOR POWER OR EQUIPMENT FAILURES AVAILABLE.	X S ☐M O U ☐NA
5. ALL NEEDED TREATMENT UNITS IN SERVICE	X S ☐M O U ☐NA
6. ADEQUATE NUMBER OF QUALIFIED OPERATORS PROVIDED.	☐S X M OU ☐NA
7. SPARE PARTS AND SUPPLIES INVENTORY MAINTAINED.	O S X M ☐U ☐NA
8. OPERATION AND MAINTENANCE MANUAL AVAILABLE.	X Y ☐N ☐NA
STANDARD OPERATING PROCEDURES AND SCHEDULES ESTABLISHED.	X Y O N ☐NA
PROCEDURES FOR EMERGENCY TREATMENT CONTROL ESTABLISHED.	X Y ☐N ☐NA

NEW MEXICO DEPARTMENT OF GAME AND FISH – LOS OJOS FISH HATCHERY	PERMIT NO. NM0030139

SECTION C - OPERATIONS AND MAINTENANCE (CONT'D)

9. HAVE BYPASSES/OVERFLOWS OCCURRED AT THE PLANT OR IN THE COLLECTION SYSTEM IN THE LAST YEAR?	O Y O N X NA
IF SO, HAS THE REGULATORY AGENCY BEEN NOTIFIED?	O Y ☐ N X NA
HAS CORRECTIVE ACTION BEEN TAKEN TO PREVENT ADDITIONAL BYPASSES/OVERFLOWS?	O Y O N X NA
10.HAVE ANY HYDRAULIC OVERLOADS OCCURRED AT THE TREATMENT PLANT?	☐ Y O N X NA
IF SO, DID PERMIT VIOLATIONS OCCUR AS A RESULT?	☐ Y ☐ N X NA

SECTION D - SELF-MONITORING

PERMITTEE SELF-MONITORING MEETS PERMIT REQUIREMENTS. X S ☐ M ☐ U ☐ NA *(FURTHER EXPLANATION ATTACHED YES).*
DETAILS:

1. SAMPLES TAKEN AT SITE(S) SPECIFIED IN PERMIT.	X Y ☐ N ☐ NA
2. LOCATIONS ADEQUATE FOR REPRESENTATIVE SAMPLES.	X Y ☐ N ☐ NA
3. FLOW PROPORTIONED SAMPLES OBTAINED WHEN REQUIRED BY PERMIT.	O Y ☐ N X NA
4. SAMPLING AND ANALYSES COMPLETED ON PARAMETERS SPECIFIED IN PERMIT.	X Y ☐ N ☐ NA
5. SAMPLING AND ANALYSES PERFORMED AT FREQUENCY SPECIFIED IN PERMIT.	X Y ☐ N ☐ NA
6. SAMPLE COLLECTION PROCEDURES ADEQUATE	X Y ☐ N ☐ NA
a) SAMPLES REFRIGERATED DURING COMPOSITING.	O Y ☐ N X NA
b) PROPER PRESERVATION TECHNIQUES USED.	X Y ☐ N ☐ NA
c) CONTAINERS AND SAMPLE HOLDING TIMES CONFORM TO 40 CFR 136.3.	X Y ☐ N ☐ NA
7. IF MONITORING AND ANALYSES ARE PERFORMED MORE OFTEN THAN REQUIRED BY PERMIT, ARE THE RESULTS REPORTED IN PERMITTEE'S SELF-MONITORING REPORT?	O Y X N ☐ NA

SECTION E - FLOW MEASUREMENT

PERMITTEE FLOW MEASUREMENT MEETS PERMIT REQUIREMENTS. O S ¨ M X U ☐ NA *(FURTHER EXPLANATION ATTACHED YES)*
DETAILS:

1. PRIMARY FLOW MEASUREMENT DEVICE PROPERLY INSTALLED AND MAINTAINED. TYPE OF DEVICE	X Y ☐ N ☐ NA
2. FLOW MEASURED AT EACH OUTFALL AS REQUIRED.	X Y ☐ N ☐ NA
3. SECONDARY INSTRUMENTS (TOTALIZERS, RECORDERS, ETC.) PROPERLY OPERATED AND MAINTAINED.	O Y ☐ N X NA
4. CALIBRATION FREQUENCY ADEQUATE.	O Y X N ☐ NA
RECORDS MAINTAINED OF CALIBRATION PROCEDURES.	O Y X N ☐ NA
CALIBRATION CHECKS DONE TO ASSURE CONTINUED COMPLIANCE.	O Y X N ☐ NA
5. FLOW ENTERING DEVICE WELL DISTRIBUTED ACROSS THE CHANNEL AND FREE OF TURBULENCE.	X Y ☐ N ☐ NA
6. HEAD MEASURED AT PROPER LOCATION.	O Y X N ☐ NA
7. FLOW MEASUREMENT EQUIPMENT ADEQUATE TO HANDLE EXPECTED RANGE OF FLOW RATES.	X Y ☐ N ☐ NA

SECTION F – LABORATORY

PERMITTEE LABORATORY PROCEDURES MEET PERMIT REQUIREMENTS. X S ☐ M ☐ U ☐ NA *(FURTHER EXPLANATION ATTACHED NO)*
DETAILS:

1. EPA APPROVED ANALYTICAL PROCEDURES USED *(40 CFR 136.3 FOR LIQUIDS, 503.8(b) FOR SLUDGES)*	X Y ¨ N ☐ NA

NEW MEXICO DEPARTMENT OF GAME AND FISH – LOS OJOS FISH HATCHERY | **PERMIT NO. NM0030139**

SECTION F - LABORATORY (CONT'D)

2. IF ALTERNATIVE ANALYTICAL PROCEDURES ARE USED, PROPER APPROVAL HAS BEEN OBTAINED ☐Y ☐N X NA

3. SATISFACTORY CALIBRATION AND MAINTENANCE OF INSTRUMENTS AND EQUIPMENT. X S O M ☐U ☐NA

4. QUALITY CONTROL PROCEDURES ADEQUATE. X S ☐M ☐U ☐NA

5. DUPLICATE SAMPLES ARE ANALYZED. 10 % OF THE TIME. X Y ☐N ☐NA

6. SPIKED SAMPLES ARE ANALYZED. ___ % OF THE TIME. ☐Y ☐N X NA

7. COMMERCIAL LABORATORY USED. X Y ☐N ☐NA

LAB NAME NM Department of Health, Scientific Laboratory Division — Huther & Associates, Inc

LAB ADDRESS 1101 Camino del Salud, NE; Albuquerque, NM — 1156 North Bonnie; Denton, TX

PARAMETERS PERFORMED TP, TN, E. Coli — WET monitoring

SECTION G - EFFLUENT/RECEIVING WATERS OBSERVATIONS. X S ☐M O U ☐NA *(FURTHER EXPLANATION ATTACHED NO).*

OUTFALL NO.	OIL SHEEN	GREASE	TURBIDITY	VISIBLE FOAM	FLOAT SOL.	COLOR	OTHER
001	None	None	None	None	None	None	
002	None	None	None	None	None	None	

RECEIVING WATER OBSERVATIONS
The Rio Chama is approximately 3 miles from hatchery with access only through private property. The discharge from the facility at the two outfalls to the ponds as well as the irrigation ditch appears to be clear.

SECTION H - SLUDGE DISPOSAL

SLUDGE DISPOSAL MEETS PERMIT REQUIREMENTS. O S ☐M ¨ U X NA *(FURTHER EXPLANATION ATTACHED NO).*
DETAILS:

1. SLUDGE MANAGEMENT ADEQUATE TO MAINTAIN EFFLUENT QUALITY. O S ☐M ☐U ☐NA

2. SLUDGE RECORDS MAINTAINED AS REQUIRED BY 40 CFR 503. O S ☐M ☐U ☐NA

3. FOR LAND APPLIED SLUDGE, TYPE OF LAND APPLIED TO: N/A (e.g., FOREST, AGRICULTURAL, PUBLIC CONTACT SITE)

SECTION I - SAMPLING INSPECTION PROCEDURES *(FURTHER EXPLANATION ATTACHED ___).*

1. SAMPLES OBTAINED THIS INSPECTION. ☐Y X N ☐NA

2. TYPE OF SAMPLE OBTAINED

GRAB _____ COMPOSITE SAMPLE ___ METHOD _____ FREQUENCY

3. SAMPLES PRESERVED. ☐Y ☐N ☐NA

4. FLOW PROPORTIONED SAMPLES OBTAINED. ☐Y ☐N ☐NA

5. SAMPLE OBTAINED FROM FACILITY'S SAMPLING DEVICE. ☐Y ☐N ☐NA

6. SAMPLE REPRESENTATIVE OF VOLUME AND MATURE OF DISCHARGE. ☐Y ☐N ☐NA

7. SAMPLE SPLIT WITH PERMITTEE. ☐Y ☐N ☐NA

8. CHAIN-OF-CUSTODY PROCEDURES EMPLOYED. ☐Y ☐N ☐NA

9. SAMPLES COLLECTED IN ACCORDANCE WITH PERMIT. ☐Y ☐N ☐NA

New Mexico Department of Game and Fish
Los Ojos Fish Hatchery
NPDES Permit No. NM0030139
Compliance Evaluation Inspection
September 25, 2014

Introduction:

On September 25, 2014, a Compliance Evaluation Inspection (CEI) was conducted at the New Mexico Department of Game and Fish (NMDG&F) Los Ojos Fish Hatchery located in Rio Arriba County, Los Ojos, New Mexico, by Ms. Sandra Gabaldon and Mr. Daniel Valenta of the New Mexico Environment Department (NMED), Surface Water Quality Bureau (SWQB). The Los Ojos Fish Hatchery has a design flow capacity of 3.32 Million Gallons per Day (MGD) and is classified as an industrial discharger under the federal Clean Water Act (CWA), Section 402 of the National Pollutant Discharge Elimination System (NPDES) permit program and is assigned permit number NM0030139.

Los Ojos Fish Hatchery is permitted to discharge from two outfalls, Outfall 001 and Outfall 002. Outfall 001 discharges to an unnamed ditch, thence to Upper Laguna del Campo pond, thence to Lower Laguna del Campo, thence to either the La Puente Ditch for irrigation purposes and / or the Rio Chama in segment 20.6.4.119 of the Rio Grande Basin (NMAC – *State of New Mexico Standards for Interstate and Intrastate Surface Waters*). Discharge from Outfall 002 is to the La Puente Ditch, thence to either Laguna del Campo or irrigation, thence to the Rio Chama in Segment 20.6.4.119 of the Rio Grande Basin (NMAC– *State of New Mexico Standards for Interstate and Intrastate Surface Waters*). Designated uses of Segment 20.6.4.119 are: Domestic water supply, fish culture, high quality coldwater aquatic life, irrigation, livestock watering, wildlife habitat and primary contact; and public water supply in the Rio Brazos and Rio Chama.

The NMED performs a certain number of CEI's for the U.S. Environmental Protection Agency (USEPA) each year. The purpose of this inspection is to provide USEPA with information to evaluate the permittee's compliance with their NPDES permit. This report is based on review of files maintained by the permittee and NMED, on-site observation by NMED personnel, and verbal information provided by the permittee's representatives.

An entrance interview was conducted with Mr. Richard Keller, Assistant Manager, at approximately 1322 hours on September 25, 2014. The inspector made introductions, presented her credentials and discussed the purpose of the inspection. An exit interview to discuss the preliminary findings of the inspection was conducted at approximately 1640 hours on September 25, 2014 with Mr. Keller at the hatchery office.

Treatment Scheme:

Rainbow Trout (fry, fingerlings and subcatchables) and Kokanee Salmon (fry, fingerlings, and subcatchables) are raised at this 90 acre site. The Kokanee Salmon eggs are hatched from approximately October through November and Rainbow Trout are hatched year round.

Fresh water is supplied through seven springs that gravity flow to a covered building in which there is a single tube (approximately 24") with three descending outer rings that provide aeration. This system is a flow through system. Water then flows to A, B, and C raceways (approximately 36), which is a covered, fenced area to provide security from outside predators, such as raptors, and other large mammals. From this area, the water flows to a covered sedimentation pond. According to Mr. Keller, this pond doesn't provide settling as needed and is basically a flow through pond. After the pond, water flows to another series of raceways called the D-battery (approximately 20). These are currently not being utilized to rear fish. Then, the flow enters J-battery. In addition, the facility has a hatchery building for rearing eggs and fry.

The raceways (A, B, and C) are cleaned on a weekly rotating basis. This is done by cleaning A raceways one day, then B another day and C on another day. On this day, Mr. Keller was in the process of cleaning A raceways. The process of cleaning requires Mr. Keller to get into the raceways and manually scrub down the bottom of the raceways from one end to the other. The solids removed are discharged to Outfall 001.

Solids Removal:

Currently, the solids that are removed and vacuumed up with a newly purchased vacuum truck and are then spray irrigated on their 90 acres.

Mortality fish are buried onsite in unlined pits.

It is suggested that the NMDG&F contact the New Mexico Environment Department, Ground Water Quality Bureau (GWQB), to determine if a groundwater permit is required for both the spray irrigated water as well as the unlined mortality pits.

New Mexico Department of Game and Fish
Los Ojos Fish Hatchery
NPDES Permit No. NM0030139
Compliance Evaluation Inspection
September 25, 2014

Further Explanations:

Note: The sections are arranged according to the format of the enclosed EPA Inspection Checklist (Form 3560-3), rather than being ranked in order of importance.

Section B – Recordkeeping and Reporting – Overall Rating of "Marginal"

Permit Requirements for Recordkeeping and Reporting:

Part I, Section B. Schedule of Compliance:

The Los Ojos Fish Hatchery has a compliance schedule for Total Phosphorus, Total Nitrogen and E. coli bacteria. In a letter dated April 3, 2014, Ms. Tiffany Timmons, Compliance Evaluation Specialist stated "the NMDG&F has met the Phase 1 interim effluent limitations as listed in our permit for Total Nitrogen (TN) and E. coli bacteria as of March 31, 2014." Results were provided by NMDG&F as follows:

Pollutant:	Date Sampled:	Lab Results:	Interim Limit (Avg/Max)
E. Coli	12/17/2013	2.0 MPN/100 ml	126/235 MPN/100 ml
	03/11/2014*	<1 MPN/100 ml	
TN	12/17/2013	1.25 mg/L	3 / 4.5 mg/L
	3/4/2014	1.75 mg/L	
TP	12/17/2013	0.159 mg/L	0.24 / 0.36 mg/L
	3/4/2013	0.288 mg/L	
*An E. coli sample was taken on 3/4/2014, but holding time and arrival temperature were exceeded so a replacement sample was taken on 3/11/2014 and those results are reported.			

Part III, Section C.4, Record Contents:

Records of monitoring information shall include:

a. The date, exact place, and time of sampling or measurement;
b. The individual(s) who performed the sampling or measurement;
c. The date(s) and time(s) analyses were performed;
d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

Part III, Section C.3, Retention of Records:

> *The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application.*

Findings for Recordkeeping and Reporting:

Review of the bench sheets from the New Mexico Department of Health, Scientific Laboratory Division, for the compliance schedule in Part I, Section B, states that the Temperature at Receipt (arrival temperature) of the E.coli sample taken on December 17, 2013 is at 12.2° Celsius. This exceeds the temperature of 10.0° for E.coli compliance samples (Please see chart above for 12/17/2013 results). These results are invalid for reporting purposes.

The permittee was asked to provide bench sheets for the parameters that they sample and analyze on-site (pH and Settleable Solids). The bench sheet for pH provided all the information as required from Part III, Section C.4. The bench sheet for Settleable Solids (SS) was provided on the same sheet as the daily weir recordings. This bench sheet provided the date; start time; stop time; and results. The bench sheet failed to provide all the necessary parts of Part III, Section C.4.

The permittee does not obtain Chain of Custody (COCs) records when they deliver their samples to the Department of Health, Scientific Laboratory Department. Chain of Custody records are part of the monitoring information that must be retained for three years from the date of the sample was taken.

Section C – Operation and Maintenace – Overall Rating of "Marginal"

Permit Requirements for Operation and Maintenance:

Part III, Section B.2. Proper Operation and Maintenance states:

> *The permittee shall provide an adequate operating staff which is duly qualified to carry out operation, maintenance and testing functions required to insure compliance with the conditions of this permit.*

Findings for Operation and Maintenance:

The facility is a 90 acre site with numerous raceways that need to be maintained and cleaned to insure health of the fish being reared. Currently, there are only

four (4) employees at the facility. This number is insufficient to keep up with the maintenance and operation required. In talking with Mr. Keller, he stated that four (4) more employees are needed at this time. This would require a total of eight (8) employees.

Section D – Self-Monitoring – Overall Rating of "Satisfactory"

Permit Requirements for Self Monitoring:

In Part I, Effluent Limitations, Footnotes:

> **11 The sample for pollutant pH shall be taken from **either** outfall 001 or outfall 002, and reported as Outfall 001 on the DMR.*

Findings for Self-Monitoring:

Mr. Keller has been sampling and analyzing pH for this facility. Mr. Keller stated that he gets a composite sample from both Outfall 001 and Outfall 002 and analyzes this for pH. Mr. Keller is not doing pH as required by the permit. The permit requires that he take the sample either from Outfall 001 or Outfall 002. Although it appears that Mr. Keller is providing a representative sample, adjustment should be made to follow the permit requirements.

The facility monitored more frequently than required by their permit (using approved methods), these results should be reported. The permittee did not report the E. coli samples that were taken with 40 CFR approved methods. Although these analyses were unacceptable (did not meet the preservation requirement of 10°C), they are still required to report that the sample was taken in the "Frequency of Samples" column on the DMR along with a comment stating that the sample was not used because it failed to meet the preservation requirements.

Section E – Flow Measurement – Overall Rating of "Unsatisfactory"

Permit requires in Part III, C.6. Flow Measurements:

> *Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device.*

Findings for Flow Measurement:

The NMDG&F, Los Ojos Fish Hatchery, has two outfalls: 001 and 002. Outfall 001 is approximately 32" in length and is a sharp-crested weir. Outfall 002 is a broad crested weir with an approximate length of 96". (Please see attached photos).

The permittee is using an equation from http://irrigation.wsu.edu/Content/Calculators/Water-Measurements/Rectangular-Contracted-Weir.php to calculate their flow. This calculation is used for both Outfall 001 and 002. However, review of this website, indicates that this calculation is for a rectangular weir with end contractions such as that of Outfall 001. This does not take into consideration that Outfall 002 is a broad crested weir and the calculations would be different because the structure is different. The flow readings from Outfall 002 are not calculated correctly, which causes a change in the mass loading calculations submitted to EPA on their DMR.

*To ensure accurate flow discharge measurement of a weir, there are certain general weir design requirements that apply:

1. The weir should consist of a thin plate *1/8 to ¼ inch* (3 to 6mm) thick with a straight edge or a thicker plate with a downstream chamfered edge. The upstream sharp edge prevents the nappe from adhering to the crest. Knife edges should be avoided because they are difficult to maintain. However, the upstream edge of the weir must be sharp with a right angle corners, since rounded edges will decrease the head for a given flow rate.

2. The upstream face of the weir should be smooth and *perpendicular to the axis of the channel* in both horizontal and vertical directions. The crest of the weir should also be exactly level to insure a uniform depth of flow.

3. The connection of the weir to the channel should be waterproof.

4. The length of the weir crest must be accurately determined, because the percentage of error in measured flow rate will be proportional to the error in determining these dimensions.

5. The weir should be ventilated, if necessary to prevent a vacuum form forming on the underside of the nappe.

6. The height of the weir from the bottom of the channel to the crest should be at least two times the maximum expected head of liquid above the crest. This is necessary to lower the velocity of approach.

7. *The approach section should be straight upstream from the weir for a distance of at least 20 times the maximum expected head of liquid, and should be little or no slope*.

8. The crest must be set higher than the maximum downstream elevation of the water surface.

9. *The device for measuring the head (staff gauge in this case) should be placed upstream at a distance of at least 3 times the maximum expected head on the weir and should be located in a quiet section of the channel away from all disturbances, preferably in a stilling well. Also, the zero point of the head measuring device must be set exactly at the level of the weir crest*.

10. *The crest of the weir must be kept clean. Fibers, stringy materials, and larger particles tend to cling to the crest and should be removed periodically. The upstream side of the weir should also be periodically purged of accumulated silt and solids.*

11. The weir size should be selected only after preliminary studies have determined the expected flow rates in the channel in question.

12. The cross sectional area of the approach of the channel should be at least 8 times that of the nappe of the crest for a distance upstream of 15 to 20 times the head of the crest. This is necessary to minimize the velocity of approach. The approach channel should also permit the liquid to approach the weir in a smooth stream free from turbulence, and the velocity should be uniformly distributed over the channel; this may be accomplished through the use of baffle plates if necessary.

13. If the weir pool is smaller than defined by the above criteria, the velocity of approach may be too high and the head reading too low.

14. When installing a rectangular weir with end contractions, the distance from the side of the weir notch to the side of the channel should be at *least twice the maximum expected head on the weir*. This is necessary to allow the liquid in the channel a free, unconstrained lateral approach to the weir crest.

**Isco Open Channel Flow Measurement Handbook, Fifth Edition*

It is suggested that the Permittee review the requirements of installation and maintenance, as some corrections need to be made.

Some corrections that need to be made include (other corrections may be necessary once the permittee looks at the requirements and reviews rectangular weir with contractions):

A. Placement of the staff gauge (see photo #2); the staff gage reading was approximately 2" on the day of inspection. The placement of the staff gauge appears to be closer than the required three times the expected head.

B. The cleaning of the weir. As seen in photo # 2, the weir needs to be cleaned and should be done on a regular basis.

C. The thickness of the weir plate. The weir plate appears thicker than 1/8 thick and may be thicker than the upper limit of ¼ inch. The inspector did not measure the plate during this inspection.

NMED/SWQB
Official Photograph Log
Photo # 1

Photographer: Daniel Valenta	Date: September 25, 2014	Time: 1400 Hours
City/County: Los Ojos / Rio Arriba		State: New Mexico
Location: New Mexico Department of Game and Fish / Los Ojos Fish Hatchery		
Subject: Outfall of 001		

NMED/SWQB
Official Photograph Log
Photo # 2

Photographer: Daniel Valenta	Date: September 25, 2014	Time: 1400 Hours
City/County: Los Ojos / Rio Arriba		State: New Mexico
Location: New Mexico Department of Game and Fish / Los Ojos Fish Hatchery		
Subject: Close-up of staff gauge and weir at Outfall 001, debris and solids.		

NMED/SWQB
Official Photograph Log
Photo # 3

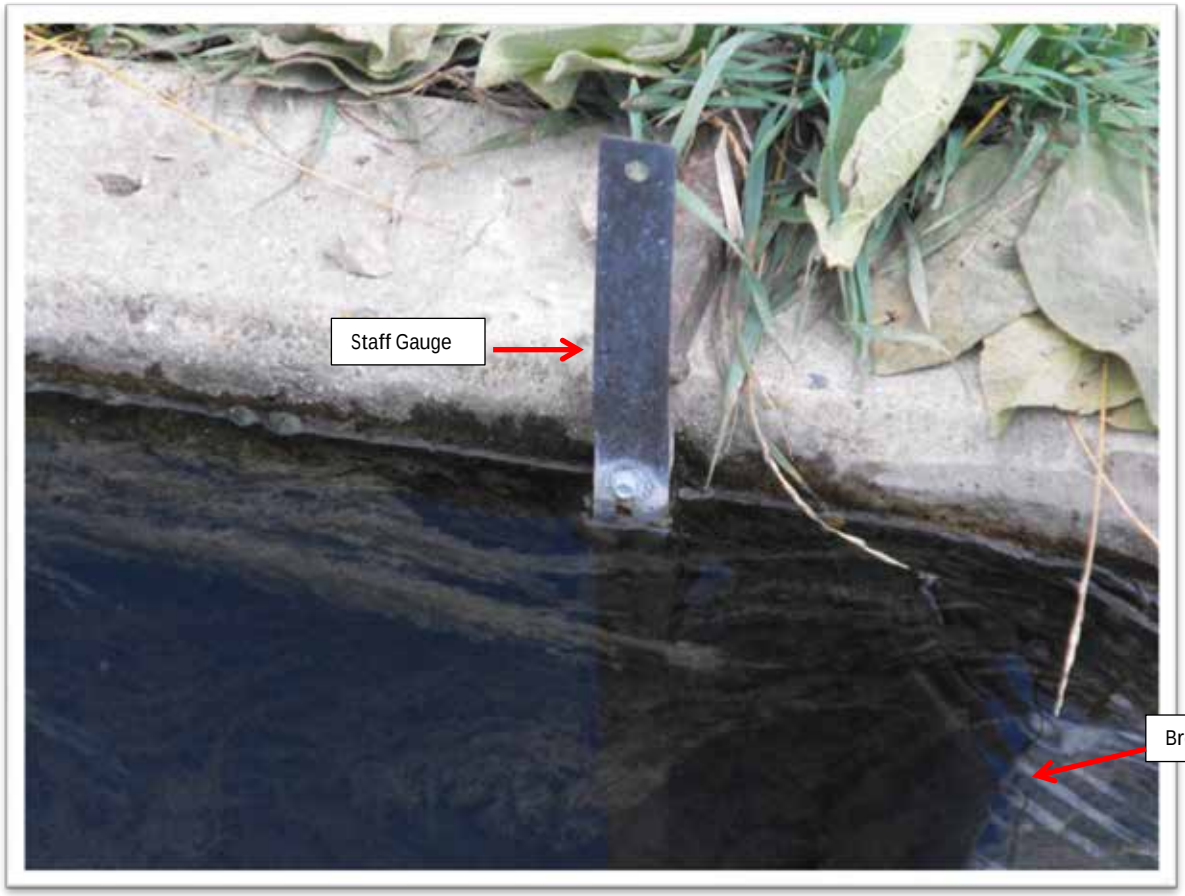
Photographer: Daniel Valenta	Date: September 25, 2014	Time: 1401 Hours
City/County: Los Ojos / Rio Arriba		State: New Mexico
Location: New Mexico Department of Game and Fish / Los Ojos Fish Hatchery		
Subject: Outfall 001, facing east		

NMED/SWQB
Official Photograph Log
Photo # 4

Photographer: Daniel Valenta	Date: September 25, 2014	Time: 1413 Hours
City/County: Los Ojos / Rio Arriba		State: New Mexico
Location: New Mexico Department of Game and Fish / Los Ojos Fish Hatchery		
Subject: Outfall 002 – Broad Crested Weir		

NMED/SWQB
Official Photograph Log
Photo # 5

Photographer: Daniel Valenta	Date: September 25, 2014	Time: 1415 Hours
City/County: Los Ojos / Rio Arriba		State: New Mexico
Location: New Mexico Department of Game and Fish / Los Ojos Fish Hatchery		
Subject: Outfall 002 – Picture of staff gauge		



GOVERNOR
Susana Martinez

DIRECTOR AND SECRETARY
TO THE COMMISSION
Alexandra Sandoval

DEPUTY DIRECTOR
Daniel E. Brooks

STATE OF NEW MEXICO
DEPARTMENT OF GAME & FISH

One Wildlife Way, Santa Fe, NM 87507

Post Office Box 25112, Santa Fe, NM 87504

Tel: (505) 476-8000 | Fax: (505) 476-8123

For information call: (888) 248-6866

www.wildlife.state.nm.us

November 4, 2014

Mr. Bruce Yurdin
Program Manager
Point Source Regulation Division
New Mexico Environment Department – SWQB
P.O. Box 5469
Santa Fe, NM 87502

Dear Mr. Yurdin:

The New Mexico Department of Game and Fish (NMDGF) has reviewed the NPDES Compliance Evaluation Inspection (CEI) generated on October 14, 2014 from an inspection conducted by Ms. Sandra Gabaldon of the New Mexico Environment Department (NMED) on behalf of the U. S. Environmental Protection Agency (USEPA) at the Los Ojos State Fish Hatchery, NPDES Permit #NM0030139, on September 25, 2014. The following comments are in response to the report.

Cover Letter

CORRECTION: The subject line of the cover letter refers to Los Ojos as a "Major; Industrial Individual Permit." Los Ojos is categorized as a "Minor Non-Municipal" industrial permit on the NMED website and identified as such in previous inspections.

Solids Removal (Page 2)

CORRECTION: The report states that "Mortality fish are buried on site in unlined pits" when, in fact, mortality fish are composted on site and the compost is used as fertilizer for other NMDGF operations both on site and off site.

We have looked into the need for a groundwater discharge permit and do not believe that we currently meet the requirements for obtaining one. We discharge approximately 3,000 gallons every two weeks which averages less than 215 gallons per day for both Outfall 001 and Outfall 002. This is well below the threshold of 2,000 gallons per day required for a groundwater discharge permit. Additionally, according to 20.6.2.3105.C NMAC, "Water used for irrigated agriculture, for watering of lawns, trees, gardens or shrubs, or for irrigation for a period not to exceed five years for the revegetation of any disturbed land area, unless that water is received directly from any sewerage system" is exempt. We are spraying the solid waste as a fertilizer on reclaimed farm fields as a temporary measure to meet our Interim Phase I compliance limits. We have been investigating a more permanent solution to efficiently dry the solids for use as fertilizer at other NMDGF farm facilities and do not expect to continue the current spraying beyond five years. If it is determined that we need to adjust our cleaning/discharge schedule or that the exemption does not apply we will immediately take action.

Section B – Record Keeping and Reporting (Pages 3-4)

CORRECTION: The first paragraph under 'Permit Requirements, Part I, Section B' on page 3 contains multiple errors and/or omissions:

- "Ms. Tiffany Timmons, Compliance Evaluation Specialist" should be changed to "Ms. *Heather* Timmons, *Environmental Compliance* Specialist."

- While we have met the interim limits for E. coli, the quotation from the 2014 Quarter 1 Compliance report is from the introductory paragraph of the report and gives the false impression that we have met the Interim Phase I limits for Total Nitrogen, when we have not. A more appropriate quotation from that report would be "TN values have reached interim limits as of March 31, 2014 however, TN and TP compliance reporting requirements are grouped together in our permit so we are still in the Interim phase 1 for both pollutants" which can be found in the fourth paragraph of the 2014 Quarter 1 report.
- Additionally, the 2014 Quarter 2 report and results were not included in this CEI and that report clearly indicates that we are still in the reporting phase for TN and TP: "Due to the increasing trend of TN and the inconsistent results for TP NMDGF does not believe that we have sufficient results to support that the interim levels have been met. The TN and TP compliance reporting requirements are grouped together in our permit so we believe that we are still in the Interim phase 1 for both pollutants."
- The 2014 Quarter 3 compliance report was submitted on September 30, 2014, after the inspection but before the CEI was submitted. This report also states that we are still in the reporting phase for TN and TP: "As this is the first quarter to show a decrease in the TN trend and is the first consecutive quarter to have TP results below the interim limits, we believe it is premature to say we have met the Phase 1 interim limits."

CORRECTION: The first sentence of the second paragraph on page 4 states "Review of the bench sheets from the New Mexico Department of Health, Scientific Laboratory Division…" and should be changed to "Review of the Laboratory Information Management System (LIMS) report from the New Mexico Department of Health, Scientific Laboratory Division…"

Regarding the invalid test results in that same paragraph; results for the E. coli test for December 17, 2013 were not flagged by SLD so were overlooked by us during reporting. I have spoken to Paul Torres, Environmental Microbiology Section Manager at SLD, and confirmed that the reported results from December 17, 2013 should have been flagged. SLD reviewed all of our past E. coli reports and found a run of the same sample that was not invalid and two other invalid tests for non-NPDES tests we performed on our source water. SLD will issue revised reports for the additional run of the December 17, 2013 test and that are flagged appropriately for any invalid tests. Once all the revised reports are received we will correct the DMRs appropriately. Additionally, sampling and handling procedures were modified following the invalid test result in March of 2014 to include extra ice packs and early sampling times and we have not had any flagged results since.

CORRECTION: In the third paragraph on page 4 the report states "The bench sheet for Settleable Solids (SS) was provided on the same sheet as the daily weir recordings. This bench sheet provided the date; start time; stop time; and results. The bench sheet failed to provide all the necessary parts of Part III, Section C.4." Our bench sheet (enclosed) is a two page monthly sheet and does, in fact, contain all the necessary parts of Part III, Section C.4. The parts identified in the CEI report are located on page two while the rest of the required parts are on page one. The necessary parts (a – f) are labelled in red on the enclosed sheet for reference. This bench sheet design is a standard template we developed for all our hatcheries (modified for each individual permit as needed) to include all the requirements of Part III, Section C.4 as well as reducing paperwork and presenting the data efficiently for reporting. We will be happy to modify our bench sheet(s) if they are insufficient but do not believe that to be the case here.

SLD does not automatically include COCs sheets with the reports on samples that are shipped to the lab, as the majority of the samples at the hatchery are. We followed up with Chet Markham, Water Chemistry Section Manager at SLD, and will be requesting the COCs on our sample sheets from this point forward.

Section C – Operation and Maintenance (Pages 4-5)

Regarding the findings that the hatchery does not have adequate staff, we have been actively working on providing sufficient staff at the hatchery for the last 2 Quarters:

- Job postings for multiple positions, including fish culturist(s), hatchery assistant manager and hatchery manager have been advertised over the past 2 Quarters;
- Interviews to fill some of these positions have taken place over the past month. Offers have been made and we are hopeful that we will have some of those positions filled shortly;
- Staff members from other hatcheries have been made available to assist when the work load at Los Ojos requires;
- Staff schedules have been flexible as needed to ensure operations and maintenance activities are not neglected.

It should be noted that Los Ojos Hatchery has not failed to meet any operations and maintenance requirements while short the optimal number of staff.

Section D – Self Monitoring (Page 5)

To address the findings in the first paragraph of this section, hatchery staff will modify their sampling and analysis of pH to reflect the permit requirements.

We disagree with the findings in the second paragraph of this section. The second E. coli sample was taken to replace an invalid test not as additional monitoring or duplicate reporting. Reporting the results of an invalid test would have not been a representative sample of conditions at the hatchery. If we had not been able to replace the test for the quarterly reporting we would have reported NODI = H (Invalid Test) for E.coli. As we were able to replace the invalid test with a valid one, those were the results we reported. We do include the results of duplicate tests, done for quality control, in our DMR reporting as indicated on our bench sheets.

Section E – Flow Measurement (Pages 5-7)

We concur that the flow calculations for Outfall 002 should be for a broad crested weir and have updated our flow charts and bench sheets accordingly (see enclosed bench sheet). Currently, the Quarter 3 2014 DMRs are correct and we will correct DMRs from Quarter 1 and 2 as well. We will investigate the need to correct older DMRs. Additionally, we will move the measurement gauge to the appropriate location.

We have purchased the materials to convert Outfall 002 to a sharp crested weir, but will need to raise the walls of the concrete settling box to accommodate the changes and fulfill the design requirements. This will lead to back flow problems due to elevation so we are evaluating measuring flow at the tail end of the raceways as we have done at our Red River Hatchery. We will continue to use the broad crested weir calculations until we can make any modifications. If any modifications are made we will modify our bench sheets and flow calculations accordingly.

Due to the number of corrections required in the report we are requesting that NMED revise the CEI and resubmit. We will be happy to provide any test results, communication and/or compliance reports needed to aid in the revision. Please contact Mr. Michael Sloane, Chief of Fisheries Management Division, Mr. Roderick Gallegos, Assistant Chief of Fisheries Management Division, or myself if there are any further questions or concerns.

Sincerely,

Heather Timmons
Environmental Compliance Specialist, Fisheries Division

/S/ Heather Timmons

Encl: Los Ojos Hatchery bench sheet template

CC: Racquel Douglas (6EN-WM), Water Enforcement Branch, USEPA
Gladys Gooden-Jackson (6EN-WC), Water Enforcement Branch, USEPA *by e-mail*
Rashida Bowlin (6EN-AS), Water Enforcement Branch, USEPA *by e-mail*
Carol Peters-Wagnon (6EN-WM) Water Enforcement Branch, USEPA *by e-mail*
Tung Nguyen (6EN-WQ), Water Quality Division, USEPA *by e-mail*
Sandra Gabaldon *by e-mail*
NMED District II *by e-mail*
Michael Sloane, Division Chief – Fisheries Division, NM Department of Game and Fish
Roderick Gallegos, Asst. Chief – Fisheries Division, NM Department of Game and Fish
Los Ojos State Hatchery, NM Department of Game and Fish

LOS OJOS STATE FISH HATCHERY

Effluent Compliance Sampling Log (Page 1)

a **Month-Year**

a Exact location: Outfall 001 (Composite sample of Outfalls 001 and 002)

EPA Lab Code: NM00974

	Daily Measurements						2/Month Measurements							Quarterly Measurements							
a Date	Total Daily Flow (MGD)	Total Flow (gpm)	Outfall 001 Weir Measurement (inches)	Outfall 001 Flow (gpm)	Outfall 002 Weir Measurement (inches)	Outfall 002 flow (gpm)	Total Suspended Solids (mg/L)	Total Suspended Solids (lbs/day)	pH Sampling Time (start)	pH Sampling Time (end)	pH (su)	a Exact Sampling Time: Settable Solids	f Settable Solids (ml/L)	E. coli (CFU/100 mL = MPN/100 mL)	E. coli (BCFU/day	Total Phosphorus (mg/L)	Total Phosphorus (lbs/day)	Total Nitrogen (TKN + Nitrate + Nitrite) (mg/L) (1/quarter)	Total Nitrogen (lbs/day)	Duplicate Sample (Y/N)	b/d Name of Sampler / Analyst
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					
21																					
22																					
23																					
24																					
25																					
26																					
27																					
28																					
29																					
30																					
31																					
AVGs	**#DIV/0!**	**#DIV/0!**		**#DIV/0!**		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**			**#DIV/0!**		**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**	**#DIV/0!**		
MAX	**0.0000**	**0.0**		**0.0**		**0.0**	**0.0000**	**0.0000**			**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**		

NOTES:

~ pH sample is a grab sample from Outfall 001 or 002, reported as Outfall 001
~ Samples of Total Suspended Solids and Settable Solids are composite sediment grab samples taken during raceway cleaning
~ Samples for E. coli, Total Phosphorus and Total Nitrogen are compostie grab samples
~ Interim Phase 1 TN and TP conditions apply
~ Total Nitrogen (TN) = TKN + Nitrate + Nitrite
~ Standard methods for examination of waste water 20th edition, pH {4500-H+B}, temperature (2550), Total Residual Chlorine (4500 - C1G), and settable solids (2540 Fa)
~ Make and model of ph meter- OAKTON instuments ph tester 3+ double junction
~ Calculation for loading value-Flow {mgd} X Concentration {mgl} X 8.34
~Priority Pollutant Scan initial sample within 6/months then once during duration of permit.

LOS OJOS STATE FISH HATCHERY

Effluent Compliance Sampling Log (Page 2)

Month-Year

Exact location: Outfall 001 (Composite sample of Outfalls 001, 002 and 003) **EPA Lab Code: NM00974**

Water Collection Amounts for Compostie Grab Samples

Date: Sample Size:

Outfall	Flow (GPM)	Percent	Amount/Sample
001	#N/A	#N/A	**#N/A**
002	#N/A	#N/A	**#N/A**
Totals	**#N/A**	**#N/A**	**#N/A**

Water Collection Amounts for Compostie Grab Samples

Date: Sample Size:

Outfall	Flow (GPM)	Percent	Amount/Sample
001	#N/A	#N/A	**#N/A**
002	#N/A	#N/A	**#N/A**
Totals	**#N/A**	**#N/A**	**#N/A**

pH Meter Calibration Date: Time:

pH meter adjusted to sample temperature: (data should be within .1 pH unit of last buffer)

First pH buffer used for standardization: **7.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

Second pH buffer used to check calibration: **4.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

Third pH buffer used to check calibration: **10.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

pH Meter Calibration Date: Time:

pH meter adjusted to sample temperature: (data should be within .1 pH unit of last buffer)

First pH buffer used for standardization: **7.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

Second pH buffer used to check calibration: **4.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

Third pH buffer used to check calibration: **10.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

pH Meter Calibration Date: Time:

pH meter adjusted to sample temperature: (data should be within .1 pH unit of last buffer)

First pH buffer used for standardization: **7.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

Second pH buffer used to check calibration: **4.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

Third pH buffer used to check calibration: **10.00** @ 25°C Meter Reading:
Date Purchased: Date opened: Clarity: good Exp. Date:

Settable solids analysis: Date: c Time start c Time End: c (no less than 60 minutes)
Settable solids analysis: Date: Time start Time End: (no less than 60 minutes)

Duplicate Samples

Date	Time	TSS	Temp	pH	SS	E.coli	TP	TN

Request ID Sticker #'s

Date	Request ID Sticker # (top left of form)

NOTES:

~ pH sample is a grab sample from Outfall 001 or 002, reported as Outfall 001
~ Samples of Total Suspended Solids and Settable Solids are composite sediment grab samples taken during raceway cleaning e
~ Samples for E. coli, Total Phosphorus and Total Nitrogen are compostie grab samples
~ Interim Phase 1 TN and TP conditions apply
~ Total Nitrogen (TN) = TKN + Nitrate + Nitrite e
~ Standard methods for examination of waste water 20th edition, pH {4500-H+B}, temperature (2550), Total Residual Chlorine (4500 - C1G), and settable solids (2540 Fa)
~ Make and model of ph meter- OAKTON instuments ph tester 3+ double junction
~ Calculation for loading value-Flow {mgd} X Concentration {mgl} X 8.34
~Priority Pollutant Scan initial sample within 6/months then once during duration of permit.

Outfall 001 (Sharp Crested Rectangular)		Outfall 002 (Broad Crested)			
Head (in)	Flow (gpm)	Head (in)	Head (ft)	Flow (cfs)	Flow (gpm)
0	0	0	0.000	0	0
1/2	35	2	0.167	1.685	756
5/8	49	2 1/8	0.177	1.839	825
3/4	64	2 1/4	0.188	2.013	903
7/8	80	2 3/8	0.198	2.176	977
1	97	2 1/2	0.208	2.343	1052
1 1/8	116	2 5/8	0.219	2.531	1136
1 1/4	135	2 3/4	0.229	2.706	1214
1 3/8	155	2 7/8	0.240	2.903	1303
1 1/2	177	3	0.250	3.087	1385
1 5/8	199	3 1/8	0.260	3.274	1469
1 3/4	222	3 1/4	0.271	3.484	1564
1 7/8	245	3 3/8	0.281	3.679	1651
2	270	3 1/2	0.292	3.897	1749
2 1/8	295	3 5/8	0.302	4.099	1840
2 1/4	321	3 3/4	0.313	4.325	1941
2 3/8	347	3 7/8	0.323	4.534	2035
2 1/2	375	4	0.333	4.746	2130
2 5/8	403	4 1/8	0.344	4.983	2236
2 3/4	431	4 1/4	0.354	5.202	2335
2 7/8	460	4 3/8	0.365	5.446	2444
3	490				
3 1/8	521				
3 1/4	551				
3 3/8	583				
3 1/2	615				
3 5/8	648				
3 3/4	681				
3 7/8	714				
4	748				
4 1/8	783				
4 1/4	818				
4 3/8	854				
4 1/2	890				
4 5/8	927				
4 3/4	964				
4 7/8	1001				
5	1039				

*Updated Flow calculations for Outfall 002

NOTES:
Outfall 001 Flow from http://irrigation.wsu.edu/Content/Calculators/Water-Measurements/Rectangular-Contracted-Weir.php
Outfall 002 Flow from http://ponce.sdsu.edu/onlinechannel14.php (Discharge over a broad crested weir)

*Updated Flow calculations for Outfall 002