



Region 6 Compliance Assurance and Enforcement Division
INSPECTION REPORT

Inspection Date(s):	12/9-10/2024		
Media:	Water		
Regulatory Program(s)	Clean Water Act		
Company Name:	St. John The Baptist Parish		
Facility Names:	1. Woodland Treatment Plant 2. Reserve WWTP 3. Belle Point STP 4. River Road		
Facility Physical Locations:	1. 900 Woodland Drive, LaPlace, LA 2. North end of Cypress Rd near Hwy 61, La Place LA 3. Off U.S. Hwy 61 (Airline Hwy) behind East St. John High School, LaPlace, LA 4. 144 Water Plant Rd., LaPlace LA		
(city, state, zip code)	LaPlace, LA 70068		
Mailing address:	1811 West Airline Hwy		
(city, state, zip code)	LaPlace, LA 70068		
County/Parish:	St. John The Baptist Parish		
Facility Contact:	Clayton Fauchaux	Director of Public Works	
	c.fauchaux@stjohn-la.gov		
	985-652-9569 ext 1125		
FRS Number:			
Identification/Permit Number:	LA0064092, LA0127097, LA0065951, LA0069868		
Media Number:			
NAICS:			
SIC:	4952		
Personnel participating in inspection:			
Michael Williams	EPA/ 6EN-WMH	Inspector	281-983-2150
Chris Whitaker	LDEQ	Inspector	504-736-7739
Pete Labeof	LDEQ	Inspector	985-532-3615
Reed Alexander	St. John The Baptist Parish	Asst. Utilities Director	985-651-6800
Koi Thompson	St. John The Baptist Parish	Wastewater Treatment Mgr.	985-379-6459
Michael Curtis	Curtis Environmental	President	985-653-0000
David Curtis	Curtis Environmental	Operation Manager	985-653-0000
EPA Lead Inspector Signature/Date	 MICHAEL WILLIAMS		MICHAEL WILLIAMS 2025.03.17 14:18:10 -05'00'
	Michael D. Williams		Date
Supervisor Signature/Date			
	Roberto Bernier		Date

Section I - Introduction

PURPOSE OF THE INSPECTION

EPA Region 6 inspector, Michael Williams, arrived at the St. John The Baptist Parish Municipal Building at 12:52 pm on December 9, 2024, for unannounced National Pollutant Discharge Elimination System (NPDES) inspections at the Parish's wastewater treatment plants. During the opening conference, I met with Reed Alexander, Assistant Director of Utilities. Mr. Alexander was informed that this was an EPA lead compliance evaluation inspection to determine compliance with the facility's NPDES permits (LA0064092, LA0127097, LA0065951 & LA0069868) and facility operations and maintenance under the Clean Water Act (CWA). The inspections were conducted under the authority of the NPDES permit program, in accordance with the Federal CWA.

The information presented in this report is based on the materials and information supplied by the St. John The Baptist Parish representatives, observations made during the inspection, and records or reports maintained by the permittee, permittee contract laboratory, the State of Louisiana and EPA.

FACILITY DESCRIPTIONS

The Woodland WWTP LA0064092

The Woodland Wastewater Treatment Plant (WWTP) utilizes an activated sludge process for wastewater treatment with a capacity of 3.3 mgd. Initially, the wastewater passes through a mechanical bar screen to remove large debris, followed by a grit chamber that removes heavier particles. After this, the water flows into two treatment tanks, each designed with three internal chambers. The aeration chamber receives the flow from the grit chamber and provides oxygenation to the water, promoting the breakdown of organic matter. The water then moves to the center clarifier, where solids are allowed to settle.

Following clarification, the treated water is filtered through a sand filter to further remove any remaining particles. It then enters the chlorine chamber for disinfection before being discharged at Outfall 001 into Vicknair Canal thence to Maurepas Swamp, thence to Lake Maurepas. In addition to the primary treatment process, each tank is equipped with an internal digester where sludge is further processed. The solids from the digester are dewatered using one of the eleven drying beds, completing the treatment cycle.

The Reserve WWTP LA0127097

The Reserve Wastewater Treatment Plant (WWTP) is a lagoon-based system with a treatment capacity of 5.0 million gallons per day (mgd). It serves the Reserve residential area, including its commercial businesses and industrial park. The system is designed with several key components to efficiently treat wastewater.

The treatment process begins at the headworks, which are equipped with eight fine mesh screens to remove large debris and prevent clogging of downstream equipment. From there, wastewater flows into four oxidation ponds, each of which is equipped with surface aerators to promote aerobic treatment. These aerators introduce oxygen into the water, facilitating the breakdown of organic material by microorganisms.

After undergoing treatment in the oxidation ponds, the effluent flows into the final treatment cell. From this point, the water is directed to a chlorine contact chamber where it undergoes disinfection to eliminate pathogens. Once disinfected, the treated effluent is pumped and discharged into the Mississippi River.

Belle Point STP LA0065951

The Belle Point Sewage Treatment Plant (STP) is currently in the process of being decommissioned. During the inspection, the demolition of the plant's tanks was actively underway. Since 2021, the influent that was previously processed at Belle Point has been redirected to the Reserve Wastewater Treatment Plant (WWTP) for treatment. The decommissioning efforts include dismantling the existing infrastructure and ceasing operations at the Belle Point facility, as all wastewater is now being handled by the Reserve WWTP.

River Road WWTP LA0069868

The River Road Wastewater Treatment Plant (WWTP) utilizes a 4.5 million gallon per day (mgd) activated sludge treatment process to treat wastewater. The system begins with a mechanical bar screen, which is used to remove large debris from the influent. The wastewater then flows into four aeration basins, where oxygen is introduced to support the growth of microorganisms that break down organic matter.

After aeration, the water flows to two clarifiers, where the solids settle out of the wastewater. The clarified water is then directed to a chlorine contact chamber for disinfection before discharging to outfall 001 into Haydel Canal: thence into the Mississippi River.

The plant also includes two digesters that process the residual sludge. In these digesters, the sludge undergoes biological treatment, which stabilizes the material. Once stabilized, the sludge is dewatered using a belt press, reducing its volume and preparing it for final disposal.

Section II- Observations

This inspection revealed the following observations:

Woodland Treatment Plant LA0064092 Specific Observations:

- During the inspection, several significant issues were identified at the wastewater treatment plant. The grit chamber was not functioning, which prevented the proper removal of heavier particles from the incoming flow. As a result, the flow received minimal screening before being discharged into the aeration chambers. Both clarifiers were non-operational due to a lack of power, causing the flow to move through the clarifiers by gravity, rather than the intended mechanical process. The sand filters were also out of service, further hindering the treatment process. Furthermore, the chlorine disinfection system was not operating as designed, with chlorine being manually adjusted instead of being automatically injected in proportion to the flow rate. These issues indicate a significant disruption in the plant's ability to properly treat wastewater.
- St. John the Baptist Parish is currently in the process of decommissioning the Woodland Wastewater Treatment Plant (WWTP) and redirecting the influent to the Reserve WWTP

(LA0127097) as part of efforts to comply with the Louisiana Department of Environmental Quality (LDEQ) compliance order WE-C-22-00702, issued on November 16, 2022. The order includes a compliance schedule that the parish is working to meet. However, according to the most recent quarterly report submitted to LDEQ, the parish is currently three months behind schedule. Despite the ongoing decommissioning efforts, the parish is still required to meet the established discharge limits and monitoring requirements for the Woodland WWTP until the influent transfer is completed and LDEQ formally terminates permit LA0064092.

Reserve WWTP LA0127097 Specific Observations

- No major issues were observed with the overall operations of the Reserve Wastewater Treatment Plant (WWTP). However, it was noted that the chlorine is not being injected in proportion to the flow at the discharge point. Instead, the facility manually adjusts the chlorine feed rate for disinfection, which may not provide the precise control needed for disinfection treatment.

Belle Point STP LA0065951 Specific Observation

- Notice of Termination has not been submitted for permit LA0065951. The facility has ceased operation since 2021.

River Road WWTP LA0069868 Specific Observations

- During the inspection, several operational issues were identified at the facility. Both the bar screen and grit chamber were out of service, which impacted the initial stages of treatment. Only one clarifier was online, but its mechanical arm was malfunctioning by not rotating, preventing proper operation. The belt press was down, and the facility was relying on a mobile belt press to dewater solids from the digester.
- It was also observed that the chlorine chamber was filled with solids, which could impede its function. Furthermore, a hydraulic surge was occurring due to the reduced treatment capacity, particularly during peak flow periods, which further compromised the facility's ability to manage wastewater effectively.

Contract Laboratory for St. John the Baptist Parish Specific Observations

- Curtis Environmental, the contracted laboratory for St. John the Baptist Parish, is responsible for conducting discharge monitoring analysis. However, the laboratory failed to follow the required procedures for Biochemical Oxygen Demand (BOD) testing and reporting. Specifically, the lab did not check or document the pH and chlorine levels, as required by Standard Methods 5210 B. Since both pH and chlorine levels can significantly affect microbial growth, they must be measured and adjusted before conducting the BOD test. Failure to perform this critical step invalidates the test results. As a result, St. John the Baptist Parish was unable to report valid BOD results from November 2022 to November 2024.
- Additionally, while St. John the Baptist Parish collects and monitors chlorine and pH levels more frequently than required, the Curtis Environmental is only reports the values obtained on the days

when composite sampling is conducted for St. John the Baptist Parish. The parish monitors chlorine and pH levels daily. (See Attachment B)

Section III- Areas of Concern

This inspection revealed the following areas of concern:

- St. John the Baptist Parish has not adhered to the requirements outlined in Section B, General Conditions, of their LPDES Permits LA0064092 and LA0069868. Specifically, the permit stipulates that the permittee must at all times properly operate and maintain all facilities and treatment systems installed or used to ensure compliance with permit conditions. However, the parish has failed to meet this obligation. During the inspection, it was observed that several systems were neither maintained nor operated as designed, which resulted in noncompliance with permit limitations. At the Woodland Treatment Facility (Permit LA0064092), key components such as the grit chamber, clarifiers, sand filters, chlorine flow injection system, and drying bed were found to be out of service. Similarly, at the River Road WWTP (LA0069868), critical equipment, including the bar screen, grit chamber, one clarifier, the mechanical skim arm on another clarifier, and the belt press, were also out of service.
- St. John The Baptist Parish has failed to comply with Section C. Monitoring and Records of their LPDES Permit LA0064092, LA0127097 and LA0069868. The monitoring results must be conducted according to test procedures approved under 40 CFR Part 136. The monitoring and reporting of BOD from the months of November 2022 thru November 2025 were not conducted according to the procedures approved.
- St. John the Baptist Parish has failed to comply with the requirements outlined in Section C, Monitoring and Records, specifically Section 8, Additional Monitoring by the Permittee, of their LPDES permits. According to the permit, the permittee is required to conduct and report additional monitoring as part of their routine compliance. However, the contract laboratory, Curtis Environmental, only reports the chlorine and pH values on the designated bi-weekly composite sampling days. These values are recorded on the chain of custody form submitted to Curtis Environmental Services.

In addition, the parish operators collect and analyze chlorine and pH levels daily, following the approved method. While they record the maximum and minimum values of these measurements on the daily logs, the results of the additional monitoring are not being reported, as required by the permit. The failure to report these additional monitoring results constitutes a permit non-compliance, potentially impacting the parish's ability to demonstrate full compliance with all permit conditions.

Section IV – LIST OF APPENDICES

- Appendix A – Photos
- Appendix B – St. John the Baptist Parish Daily pH and Cl2 records
- Appendix C - Curtis Environmental Services BOD SOP & Bench Sheets

Appendix A

Photograph Log



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 1

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Woodland Treatment Grit Chamber



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 2

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Woodland Treatment Bar Screen



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 3

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Woodland Treatment Aeration



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 4

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Woodland Treatment Overgrown
Drying Beds



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 5

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Woodland Treatment Clarifier with
broken arm



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 6

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Woodland Treatment Chlorine Basin
with visible solids discharging



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 7

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Reserve WWTP Bar Screen



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 8

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Reserve WWTP Lagoon



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 9

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Belle Point STP being
decommissioned



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 10

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



Belle Point STP being
decommissioned.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Photograph Log

Photo No. 11

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road WWTP Out of Service Bar
Screen



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 12

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road WWTP Out of Service Grit Chamber



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 13

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road Aeration Basins



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 14

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road WWTP Clarifer



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 15

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road denitrification in Clarifier



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 16

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road WWTP Chlorine Contact
Chamber at maximum capacity



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 17

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road WWTP Chlorine Contact Chamber at maximum capacity with hydraulic surge



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Photograph Log

Photo No. 18

Location: St John the Baptist Parish		
City: La Place	County/Parish: St. John the Baptist	State: LA



River Road WWTP Digester

Appendix B

St. John the Baptist Parish Daily pH and Cl₂ records

0-18-24	19-24	25-30	31-36	37-42	43-48	49-54	55-60	61-66	67-72	73-78	79-84	85-90	91-96	97-102	103-108	109-114	115-120	121-126	127-132	133-138	139-144	145-150	151-156	157-162	163-168	169-174	175-180	181-186	187-192	193-198	199-204	205-210	211-216	217-222	223-228	229-234	235-240	241-246	247-252	253-258	259-264	265-270	271-276	277-282	283-288	289-294	295-300	301-306	307-312	313-318	319-324	325-330	331-336	337-342	343-348	349-354	355-360	361-366	367-372	373-378	379-384	385-390	391-396	397-402	403-408	409-414	415-420	421-426	427-432	433-438	439-444	445-450	451-456	457-462	463-468	469-474	475-480	481-486	487-492	493-498	499-504	505-510	511-516	517-522	523-528	529-534	535-540	541-546	547-552	553-558	559-564	565-570	571-576	577-582	583-588	589-594	595-600	601-606	607-612	613-618	619-624	625-630	631-636	637-642	643-648	649-654	655-660	661-666	667-672	673-678	679-684	685-690	691-696	697-702	703-708	709-714	715-720	721-726	727-732	733-738	739-744	745-750	751-756	757-762	763-768	769-774	775-780	781-786	787-792	793-798	799-804	805-810	811-816	817-822	823-828	829-834	835-840	841-846	847-852	853-858	859-864	865-870	871-876	877-882	883-888	889-894	895-900	901-906	907-912	913-918	919-924	925-930	931-936	937-942	943-948	949-954	955-960	961-966	967-972	973-978	979-984	985-990	991-996	997-1002	1003-1008	1009-1014	1015-1020	1021-1026	1027-1032	1033-1038	1039-1044	1045-1050	1051-1056	1057-1062	1063-1068	1069-1074	1075-1080	1081-1086	1087-1092	1093-1098	1099-1104	1105-1110	1111-1116	1117-1122	1123-1128	1129-1134	1135-1140	1141-1146	1147-1152	1153-1158	1159-1164	1165-1170	1171-1176	1177-1182	1183-1188	1189-1194	1195-1200	1201-1206	1207-1212	1213-1218	1219-1224	1225-1230	1231-1236	1237-1242	1243-1248	1249-1254	1255-1260	1261-1266	1267-1272	1273-1278	1279-1284	1285-1290	1291-1296	1297-1302	1303-1308	1309-1314	1315-1320	1321-1326	1327-1332	1333-1338	1339-1344	1345-1350	1351-1356	1357-1362	1363-1368	1369-1374	1375-1380	1381-1386	1387-1392	1393-1398	1399-1404	1405-1410	1411-1416	1417-1422	1423-1428	1429-1434	1435-1440	1441-1446	1447-1452	1453-1458	1459-1464	1465-1470	1471-1476	1477-1482	1483-1488	1489-1494	1495-1500	1501-1506	1507-1512	1513-1518	1519-1524	1525-1530	1531-1536	1537-1542	1543-1548	1549-1554	1555-1560	1561-1566	1567-1572	1573-1578	1579-1584	1585-1590	1591-1596	1597-1602	1603-1608	1609-1614	1615-1620	1621-1626	1627-1632	1633-1638	1639-1644	1645-1650	1651-1656	1657-1662	1663-1668	1669-1674	1675-1680	1681-1686	1687-1692	1693-1698	1699-1704	1705-1710	1711-1716	1717-1722	1723-1728	1729-1734	1735-1740	1741-1746	1747-1752	1753-1758	1759-1764	1765-1770	1771-1776	1777-1782	1783-1788
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108 DATE	Time	Sampled	Temp	ENT	CHL	Flow	1H	Buff 7	Buff 10	Subst	1	2	3	4
7-23-24	7:40	EFF, FC	28.2	AS	0.8	1020.002	7.09	7.01/7.00	10.05/10.00	ON	96	n/a	n/a	n/a
7-24-24	7:40	EFF, FC, JWF	29.1	AS	1.1	1540.000	7.22	7.01/7.00	10.05/10.00	ON	98	n/a	n/a	n/a
7-25-24	7:30	EFF, FC	26.2	AS	0.2	1437.000	7.99	7.01/7.00	10.06/10.00	ON	94	n/a	n/a	n/a
7-26-24	7:45	EFF, FC	21.1	AS	0.2	1607.000	7.81	7.01/7.00	10.06/10.00	ON	96	n/a	n/a	n/a
7-27-24	7:41	Weekend	26.7	RF	0.5	3494.000	7.07	7.01/7.00	10.04/10.00	ON	Weekend	Weekend	Weekend	Weekend
7-29-24	7:00	Weekend	26.4	RF	0.4	3490.000	7.04	7.01/7.00	10.04/10.00	ON	Weekend	Weekend	Weekend	Weekend
7-29-24	7:45	EFF, FC	29.9	AS	0.5	2542.000	7.52	7.01/7.00	10.04/10.00	ON	98	n/a	n/a	n/a
7-30-24	7:40	EFF, FC	28.4	AS	0.7	4785.000	7.40	7.01/7.00	10.05/10.00	ON	93	n/a	n/a	n/a
7-31-24	7:40	EFF, FC, JWF	29.6	AS	0.5	1681.000	7.36	7.01/7.00	10.05/10.00	ON	96	n/a	n/a	n/a
8-1-24	7:00 AM	EFF, FC	30.6	AS	1.2	1315.000	7.49	7.01/7.00	10.06/10.00	ON	99	n/a	n/a	n/a
8-2-24	8:00 AM	EFF, FC	30.0	AS	0.9	1253.000	7.20	7.01/7.00	10.03/10.00	ON	96	n/a	n/a	n/a
8-3-24	6:54	EFF, FC	29.5	MN	0.4	1188.000	7.28	7.01/7.00	10.05/10.00	ON	Weekend	Weekend	Weekend	Weekend
8-4-24	7:08		32.1	MN	0.3	428.000	7.44	7.01/7.00	10.03/10.00	ON	Weekend	Weekend	Weekend	Weekend
8-5-24	7:45	EFF, FC	29.6	AS	0.1	2678.000	7.52	7.01/7.00	10.03/10.00	ON	97	n/a	n/a	n/a
8-6-24	7:35	EFF, FC	29.0	AS	0.7	1286.000	7.43	7.01/7.00	10.03/10.00	ON	94	n/a	n/a	n/a
8-7-24	7:50	EFF, FC, JWF	26.5	AS	4.1	1234.000	7.39	7.01/7.00	10.03/10.00	ON	98	n/a	n/a	n/a
8-8-24	7:30	EFF, FC	29.9	AS	0.8	1094.000	7.26	7.01/7.00	10.03/10.00	ON	94	n/a	n/a	n/a
8-9-24	7:25	EFF, FC	30.4	AS	0.6	1134.000	7.21	7.01/7.00	10.03/10.00	ON	94	n/a	n/a	n/a
8-10-24	5:58		28.0	MN	0.9	937.000	7.22	7.01/7.00	10.03/10.00	ON	Weekend	Weekend	Weekend	Weekend
8-11-24	5:41		28.8	MN	0.6	970.000	7.26	7.01/7.00	10.03/10.00	ON	Weekend	Weekend	Weekend	Weekend
8-12-24	7:45	EFF, FC	29.9	AS	1.0	1042.000	7.20	7.01/7.00	10.03/10.00	ON	97	n/a	n/a	n/a
8-13-24	7:30	EFF, FC	29.3	AS	0.8	1052.000	7.29	7.01/7.00	10.03/10.00	ON	92	n/a	n/a	n/a
8-14-24	7:35	EFF, FC	30.4	AS	1.3	1141.000	7.18	7.01/7.00	10.03/10.00	ON	99	n/a	n/a	n/a
8-15-24	7:45	EFF, FC	28.6	AS	1.2	1051.000	7.47	7.01/7.00	10.03/10.00	ON	96	n/a	n/a	n/a
8-16-24	7:50	EFF, FC	28.2	AS	0.9	1170.000	7.43	7.01/7.00	10.03/10.00	ON	94	n/a	n/a	n/a

7-24-24	7:45	EFF, EC, JMF	27.1	AS	1.1	1,545,000	99	7-01/7-02	10-06/10-07	ON	94	Wk	Wk
7-25-24	7:30	EFF, EC	26.2	AS	0.2	1,437,000	91	7-01/7-02	10-06/10-07	ON	96	Wk	Wk
7-26-24	7:45	EFF, EC	21.1	AS	0.2	1,657,000	81	7-01/7-02	10-06/10-07	ON	96	Wk	Wk
7-27-24	7:41	weekend	26.7	RF	0.5	3,419,000	7	7-01/7-02	10-04/10-05	ON	98	Wk	Wk
7-28-24	7:00	weekend	26.4	RF	0.4	3,490,000	04	7-01/7-02	10-04/10-05	ON	98	Wk	Wk
7-29-24	7:45	EFF, EC	29.9	AS	0.5	2,542,000	52	7-01/7-02	10-04/10-05	ON	94	Wk	Wk
7-30-24	7:40	EFF, EC	28.4	AS	0.7	1,785,000	40	7-01/7-02	10-05/10-06	ON	96	Wk	Wk
7-31-24	9:00 AM	EFF, EC, JMF	29.6	AS	0.5	1,681,000	36	7-01/7-02	10-05/10-06	ON	99	Wk	Wk
8-1-24	7:00 AM	EFF, EC	30.6	AS	1.2	1,315,000	149	7-01/7-02	10-06/10-07	ON	96	Wk	Wk
8-2-24	8:00 AM	EFF, EC	30.0	AS	0.9	1,253,000	120	7-01/7-02	10-03/10-04	ON	96	Wk	Wk
8-3-24	6:54		29.5	MN	0.4	1,188,000	7,38	7-01/7-02	10-03/10-04	ON	96	Wk	Wk
8-4-24	7:08		32.1	MN	0.3	428,000	7,69	7-01/7-02	10-03/10-04	ON	97	Wk	Wk
8-5-24	7:45	EFF, EC	29.6	AS	0.1	2,678,000	2,52	7-01/7-02	10-03/10-04	ON	94	Wk	Wk
8-6-24	7:35	EFF, EC	29.0	AS	0.7	1,286,000	7,48	7-01/7-02	10-03/10-04	ON	96	Wk	Wk
8-7-24	7:50	EFF, EC, JMF	26.5	AS	1.1	1,254,000	7,59	7-01/7-02	10-03/10-04	ON	98	Wk	Wk
8-8-24	7:30	EFF, EC	29.9	AS	0.8	1,094,000	7,26	7-01/7-02	10-03/10-04	ON	94	Wk	Wk
8-9-24	7:25	EFF, EC	30.4	AS	0.6	1,134,000	7,21	7-01/7-02	10-03/10-04	ON	96	Wk	Wk
8-10-24	5:58		28.0	MN	0.9	937,000	7,22	7-01/7-02	10-03/10-04	ON	97	Wk	Wk
8-11-24	5:41		28.8	MN	0.6	970,000	7,36	7-01/7-02	10-03/10-04	ON	97	Wk	Wk
8-12-24	7:45	EFF, EC	29.9	AS	1.0	1,042,000	7,20	7-01/7-02	10-03/10-04	ON	92	Wk	Wk
8-13-24	7:30	EFF, EC	29.3	AS	0.8	1,052,000	7,29	7-01/7-02	10-03/10-04	ON	99	Wk	Wk
8-14-24	7:35	EFF, EC, JMF	30.4	AS	1.3	1,124,000	7,18	7-01/7-02	10-03/10-04	ON	96	Wk	Wk
8-15-24	7:45	EFF, EC	28.6	AS	1.2	1,051,000	7,47	7-01/7-02	10-03/10-04	ON	94	Wk	Wk
8-16-24	7:50	EFF, EC	28.2	AS	0.9	1,170,000	7,43	7-01/7-02	10-03/10-04	ON	94	Wk	Wk
8-17-24	8:50	weekend	28.4	RF	0.7	946,000	7,10	7-01/7-02	10-03/10-04	ON	97	Wk	Wk
8-18-24	8:04	weekend	28.2	RF	0.9	1,540,000	7,25	7-01/7-02	10-03/10-04	ON	97	Wk	Wk
8-19-24	7:30	EFF, EC	27.0	AS	0.6	1,997,000	7,04	7-01/7-02	10-03/10-04	ON	93	Wk	Wk
8-20-24	7:05	EFF, EC	22.7	AS	1.0	1,372,000	6,81	7-01/7-02	10-03/10-04	ON	96	Wk	Wk

266	Date	Int	Flow	Ref Temp	Filter	Time	Chlorine	Sulfur	Temp	100 Buffer	10.00 Buffer	Ana Time	Ph	DO	DO	MLSS	MLSS	2	2
5-3-24	KU	669,000	3%	1223	7:30am	1.8	<0.03	25.7%	100/7.00	10.03/10.00	7:40am	7.03	9.8	10.8	20	20	M		
5-4-24	RF	455,000	3%	1223	6:55	2.0	<0.03	25.2	100/7.00	10.03/10.00	7:08am	7.01	-	week end	-	-	M		
5-5-24	RF	649,000	3%	1223	7:24	1.5	<0.03	26.0	1.00/7.00	10.03/10.00	7:31am	6.96	-	week end	-	-	M		
5-6-24	KU	569,000	3%	1223	7:25am	1.5	<0.03	26.0%	100/7.00	10.00/10.00	7:35am	6.97	9.6	10.8	20	15	M		
5-7-24	PM	686,000	3%	1223	7:10am	0.6	<0.03	26.0%	100/7.00	10.00/10.00	7:30am	7.05	9.0	9.9	20	15	M		
5-8-24	PM	466,000	3%	1223	8:10am	0.1	<0.03	26.0%	100/7.00	10.02/10.00	8:10am	7.01	9.2	10.2	20	15	M		
5-24	PM	540,000	3%	1223	7:20am	2.1	<0.03	26.9%	100/7.00	10.00/10.00	7:30am	7.01	9.4	10.4	20	20	M		
5-10-24	PM	611,000	3%	1223	7:35am	1.1	<0.03	27.1%	100/7.00	10.01/10.00	7:45am	7.00	9.6	10.4	20	25	M		
5-11-24	RF	510,000	3%	1223	6:50am	1.1	<0.03	26.4%	100/7.00	10.01/10.00	6:54am	7.01	-	week end	-	-	M		
5-12-24	RF	548,000	3%	1223	6:24am	1.2	<0.03	26.7	100/7.00	10.01/10.00	6:31am	6.98	-	week end	-	-	M		
5-13-24	KU	636,000	3%	1223	7:40am	1.2	<0.03	26.3%	100/7.00	10.03/10.00	7:50am	7.00	9.8	10.2	15	80	M		
5-14-24	PM	643,000	3%	1223	8:10am	1.0	<0.03	25.0%	100/7.00	10.04/10.00	8:10am	7.22	9.6	10.4	15	80	M		
5-15-24	PM	512,000	3%	1223	7:20am	1.2	<0.03	25.7%	100/7.00	10.03/10.00	7:30am	7.34	9.7	10.4	20	110	M		
5-16-24	PM	402,000	3%	1223	7:10am	3.2	<0.03	26.7%	100/7.00	10.02/10.00	7:30am	7.18	9.6	10.6	20	60	M		
5-17-24	PM	293,000	3%	1223	7:45am	2.1	<0.03	26.6%	6.49/7.00	10.03/10.00	7:55am	7.17	-	Power out	-	-	M		
5-18-24	KU	141,000	3%	1223	7:00am	1.4	<0.03	25.8%	100/7.00	10.04/10.00	7:10am	7.14	-	week end	-	-	M		
5-19-24	KU	493,000	3%	1223	6:40am	1.7	<0.03	26.0%	100/7.00	10.03/10.00	6:50am	6.92	-	week end	-	-	M		
5-20-24	KU	262,000	3%	1223	7:40am	1.4	<0.03	27.5%	100/7.00	10.03/10.00	7:50am	6.54	-	Blower Down	-	-	M		
5-21-24	PM	500,000	3%	1223	9:00am	1.0	<0.03	26.5%	100/7.00	10.03/10.00	8:10am	6.80	-	Blower Down	-	-	M		
5-22-24	PM	486,000	3%	1223	7:35am	1.1	<0.03	26.8%	100/7.00	10.03/10.00	7:45am	6.71	-	Blower Down	-	-	M		
5-23-24	PM	530,000	3%	1223	7:20am	0.6	<0.03	26.7%	100/7.00	10.03/10.00	7:30am	6.91	-	Blower Down	-	-	M		
5-24-24	PM	689,000	3%	1223	7:10am	0.9	<0.03	27.3%	100/7.00	10.04/10.00	7:40am	6.75	-	Blower Down	-	-	M		
5-25-24	RF	552,000	3%	1223	7:21	2.0	<0.03	26.7	100/7.00	10.01/10.00	7:27am	6.82	-	week end	-	-	M		
5-26-24	RF	507,000	3%	1223	7:03	0.8	<0.03	26.4	100/7.00	10.01/10.00	7:10	6.72	-	week end	-	-	M		
5-27-24	RF	506,000	3%	1223	7:04	0.9	<0.03	26.6	100/7.00	10.01/10.00	7:11	6.74	-	week end	-	-	M		

268		Ref	Sample	Chlorine	Sulfur	TEMP	100 Buffer	10.00 Buffer	And	PH	DO	DO	MLSS	MLSS
Date	In	Flow	Temp	Filter	TIME	TEMP	100 Buffer	10.00 Buffer	TIME	PH	DO	DO	MLSS	MLSS
6-9-24	KU	516,000	32	1d213	6:45am	27.9°	700/700	10.03/10.00	6:55am	6.84	-	week end	-	-
6-10-24	KU	547,000	32	1d213	7:30am	28.8°	699/700	10.03/10.00	7:40am	6.90	9.4	9.6	10	50
6-11-24	PM	564,000	32	1d213	8:00am	28.3°	700/700	10.03/10.00	8:10am	6.88	9.6	9.8	10	50
6-12-24	PM	508,000	32	1d213	7:30am	28.8°	700/700	10.03/10.00	7:40am	6.63	9.1	9.6	10	50
6-13-24	PM	118,000	32	1d213	7:25am	28.5°	700/700	10.03/10.00	7:35am	6.83	9.5	9.8	10	30
6-14-24	PM	417,000	32	1d213	7:35am	28.7°	700/700	10.03/10.00	7:45am	6.91	9.7	9.8	20	30
6-15-24	PM	436,000	32	1d213	6:04am	28.4	700/700	10.03/10.00	6:16am	6.94	-	week end	-	-
6-16-24	PM	472,000	32	1d213	7:09am	28.6	700/700	10.03/10.00	7:16am	6.94	-	week end	-	-
6-17-24	KU	614,000	32	1d213	7:40am	28.1°	700/700	10.03/10.00	7:50am	6.89	9.6	10.4	10	10
6-18-24	PM	633,000	32	1d213	8:00am	28.2°	700/700	10.03/10.00	8:10am	6.82	9.8	10.8	10	10
6-19-24	PM	490,000	32	1d213	6:00am	28.4	700/700	10.03/10.00	6:34	6.94	-	Holiday	-	-
6-20-24	PM	502,000	32	1d213	7:10am	27.9	700/700	10.03/10.00	7:30	6.87	9.7	10.6	15	15
6-21-24	PM	564,000	32	1d213	7:10am	28.1	700/700	10.03/10.00	7:40	6.95	9.6	10.5	15	15
6-22-24	PM	414,000	32	1d213	6:10am	27.8	700/700	10.03/10.00	6:16am	6.94	-	week end	-	-
6-23-24	PM	485,000	32	1d213	5:44am	28.5	700/700	10.03/10.00	5:56	6.97	-	week end	-	-
6-24-24	KU	515,000	32	1d213	7:50am	29.0°	700/700	10.02/10.00	8:00am	6.99	-	NO Power	-	-
6-25-24	PM	143,000	32	1d213	7:20am	29.2	700/700	10.02/10.00	7:36	6.78	8.8	9.0	25	15
6-26-24	PM	380,000	32	1d213	8:00am	29.5°	700/700	10.02/10.00	8:10am	6.83	9.1	9.3	25	15
6-27-24	KU	474,000	42	1d213	7:40am	28.6°	700/700	10.02/10.00	7:50am	6.80	9.2	9.6	25	15
6-28-24	KU	479,000	42	1d213	7:25am	28.4°	700/700	10.03/10.00	7:35am	6.87	9.4	9.7	20	15
6-29-24	KU	473,000	42	1d213	6:30am	28.8°	700/700	10.03/10.00	6:40am	6.70	-	week end	-	-
6-30-24	KU	502,000	42	1d213	6:35am	29.1°	700/700	10.03/10.00	6:45am	6.69	-	week end	-	-
7-1-24	KU	509,000	32	1d213	7:35am	28.8°	700/700	10.01/10.00	7:45am	6.83	9.4	10.0	15	15
7-2-24	PM	513,000	32	1d213	8:10am	29.1	700/700	10.03/10.00	8:20am	6.98	9.6	9.8	15	15
7-3-24	KU	562,000	32	1d213	7:30am	29.9°	700/700	10.03/10.00	7:40am	6.84	9.6	10.1	15	15

270	DATE	Int	Flow	Ref Temp	Filter	Sample TIME	Chlorine	Sulfur	TEMP	100 Buffer	10.00 Buffer	Ana TIME	Ph	DO	DO	MLSS	MLSS
7-16-24	PM		509,000	4°C	18283	8:10am	0.9	<0.03	28.9	700/700	10.04/10.00	8:10am	7.29	9.8	10.8	10	10
7-17-24	PM		460,000	4°C	18283	7:25am	1.6	40.03	29.3	702/700	10.04/10.00	7:35am	7.03	9.7	10.6	10	10
7-18-24	PM		501,000	4°C	18283	7:20am	1.6	40.03	28.3	700/700	10.04/10.00	7:30am	7.06	9.5	10.8	10	10
7-19-24	KV		528,000	4°C	18283	7:30am	1.0	<0.03	28.2	701/700	10.04/10.00	7:40am	6.85	9.6	10.7	15	10
7-20-24	KV		492,000	3°C	18283	6:30am	1.2	<0.03	28.3	700/700	10.04/10.00	6:40am	6.77	-	week	end	-
7-21-24	KV		513,000	4°C	18283	6:40am	1.8	<0.03	27.8	700/700	10.04/10.00	6:50am	6.78	-	week	end	-
7-22-24	KV		554,000	3°C	18283	7:30am	1.0	<0.03	28.2	701/700	10.04/10.00	7:40am	7.18	9.4	10.6	15	10
7-23-24	PM		541,000	3°C	18283	8:10am	1.2	40.03	27.8	700/700	10.04/10.00	8:10am	7.16	4.6	10.4	15	10
7-24-24	PM		540,000	3°C	18283	7:10am	1.1	40.03	28.0	700/700	10.04/10.00	7:30am	7.28	9.6	10.6	10	10
7-25-24	PM		529,000	4°C	18283	7:40am	0.7	40.03	28.5	700/700	10.04/10.00	7:50am	7.13	9.5	10.6	10	10
7-26-24	PM		520,000	4°C	18283	7:30am	0.7	40.03	28.8	700/700	10.04/10.00	7:40am	7.23	9.7	10.8	10	10
7-27-24	RF		594,000	4°C	18283	7:30am	0.9	40.03	28.4	700/700	10.04/10.00	7:40am	7.14	-	week	end	-
7-28-24	RF		543,000	4°C	18283	7:19am	1.5	40.03	27.9	700/700	10.04/10.00	7:20am	7.16	-	week	end	-
7-29-24	KV		451,000	3°C	18283	7:25am	1.9	<0.03	29.3	702/700	10.00/10.00	7:35am	7.04	9.4	10.6	15	10
7-30-24	PM		627,000	3°C	18283	8:10am	1.0	40.03	29.4	700/700	10.03/10.00	8:10am	7.31	9.6	10.7	15	10
7-31-24	PM		557,000	3°C	18283	7:25am	1.0	40.03	29.1	700/700	10.03/10.00	7:35am	7.21	9.6	10.6	16	10
8-1-24	KV		550,000	4°C	18283	7:40am	1.3	<0.03	29.2	700/700	10.03/10.00	7:50am	7.08	9.8	10.8	10	10
8-2-24	PM		614,000	4°C	18283	7:30am	1.3	40.03	29.9	700/700	10.03/10.00	7:40am	7.37	9.7	10.6	10	10
8-3-24	RF		587,000	4°C	18283	7:20am	0.9	<0.03	28.7	700/700	10.03/10.00	6:27am	7.27	-	week	end	-
8-4-24	RF		518,000	4°C	18283	6:14am	1.2	<0.03	29.4	700/700	10.03/10.00	6:14am	7.29	-	week	end	-
8-5-24	KV		545,000	4°C	18283	7:30am	2.0	<0.03	28.7	700/700	10.03/10.00	7:40am	7.08	9.4	10.4	10	10
8-6-24	PM		492,000	3°C	18283	8:10am	1.7	40.03	29.9	700/700	10.03/10.00	8:10am	7.20	9.6	10.4	10	10
8-7-24	PM		507,000	3°C	18283	7:35am	1.3	40.03	30.0	700/700	10.03/10.00	7:35am	7.29	9.7	10.6	10	10
8-8-24	PM		380,000	9°C	18283	7:10am	1.6	40.03	29.5	700/700	10.03/10.00	7:30am	7.14	9.4	10.8	10	10
8-9-24	PM		330,000	9°C	18283	7:10am	1.5	40.03	30.0	700/700	10.02/10.00	7:30am	7.14	9.6	10.6	10	10

272	Ref	Sample	100 Buffer	10.00 Buffer	Ana	Ph	DO	2	1	2					
Date	Int	Flow	Temp	Filter	Time	choline sulfate	Temp	100 Buffer	10.00 Buffer	Time	Ph	DO	DO	ML55	ML55
8-22-24	DM	467.000	3°C	12223	7:35am	1.4	29.1°C	700/7.00	10.04/10.00	7:45am	7.13	9.6	10.7	10	10
8-23-24	DM	456.000	4°C	12223	7:30am	0.7	29.5°C	702/7.00	10.03/10.00	7:40am	7.21	9.4	10.7	10	10
8-24-24	DM	440.000	3°C	12223	7:19am	1.5	29.2	700/7.00	10.03/10.00	7:24am	7.17	-	week end	-	-
8-25-24	DM	415.000	3°C	12203	6:12b	1.2	29.4	700/7.00	10.03/10.00	6:32	7.23	-	week end	-	-
8-26-24	KU	451.000	3°C	12223	7:30am	2.0	30.0°C	700/7.00	10.04/10.00	7:40am	7.08	9.6	10.4	10	10
8-27-24	DM	449.000	3°C	12223	8:00am	0.8	29.7°C	700/7.00	10.06/10.00	8:10am	6.99	9.4	10.6	10	10
8-28-24	DM	487.000	3°C	12223	7:25am	1.1	29.6°C	700/7.00	10.03/10.00	7:35am	6.98	9.5	10.6	10	10
8-29-24	DM	534.000	3°C	12223	7:25am	0.9	29.7°C	700/7.00	10.04/10.00	7:35am	7.11	9.6	10.7	10	10
8-30-24	DM	498.000	4°C	12223	7:30am	1.3	29.7°C	700/7.00	10.04/10.00	7:40am	6.85	9.4	10.6	10	10
8-31-24	KU	479.000	4°C	12223	6:55am	1.2	28.1°C	700/7.00	10.04/10.00	7:05am	6.86	-	week end	-	-
9-1-24	KU	427.000	3°C	12223	7:00am	0.8	28.1°C	701/7.00	10.04/10.00	7:10am	6.75	-	week end	-	-
9-2-24	KU	408.000	3°C	12223	6:50am	0.8	28.6°C	700/7.00	10.04/10.00	7:00am	6.76	-	Ho1 iday	-	-
9-3-24	DM	447.000	3°C	12223	7:35am	1.0	29.7°C	700/7.00	10.04/10.00	7:45am	6.85	9.3	10.6	10	10
9-4-24	DM	579.000	4°C	12223	8:00am	0.6	29.7°C	700/7.00	10.04/10.00	8:10am	6.87	9.4	10.5	10	10
9-5-24	DM	563.000	3°C	12223	7:20am	1.0	28.8°C	700/7.00	10.04/10.00	7:30am	6.82	9.6	10.8	10	10
9-6-24	DM	497.000	3°C	12223	7:12am	1.0	27.6°C	700/7.00	10.04/10.00	7:30am	6.92	9.4	10.6	10	10
9-7-24	DM	552.000	3°C	12223	7:25am	0.9	27.4	700/7.00	10.04/10.00	7:30am	6.88	-	week end	-	-
9-8-24	DM	418.000	3	12223	8:40am	1.0	28.4	700/7.00	10.04/10.00	8:44	6.91	-	week end	-	-
9-9-24	KU	349.000	3°C	12223	7:20am	2.8	27.1°C	701/7.00	10.04/10.00	7:30am	6.54	9.2	10.4	10	10
9-10-24	DM	400.000	3°C	12223	8:00am	0.9	28.1°C	701/7.00	10.04/10.00	8:10am	6.67	9.4	10.6	10	10
9-11-24	KU	438.000	3°C	12223	7:15am	1.0	27.0°C	701/7.00	10.04/10.00	7:25am	6.75	9.5	10.8	10	10
9-12-24	KU	No Power	Francine	Down	7:30am	1.8	26.9°C	700/7.00	10.02/10.00	7:40am	6.65	-	Down	Down	-
9-13-24	KU	No Power	4°C	Down	7:30am	2.4	28.2°C	700/7.00	10.04/10.00	7:40am	6.30	-	Down	Down	-
9-14-24	DM	No Power	4°C	Down	7:20am	2.1	28.7	700/7.00	10.02/10.00	7:30am	6.20	-	week end	-	-
9-15-24	DM	No Power	4°C	Down	7:19am	1.4	28.4	700/7.00	10.04/10.00	7:24am	6.36	-	week end	-	-

Appendix C

Curtis Environmental Services Standard Operating Procedures for BOD & BOD Bench Sheets

4.

Curtis Environmental
Services SOPs for
BOD, Fecal Coliform,
Total Phosphorous,
Total Kjeldahl
Nitrogen, TSS, &
NO₂+NO₃

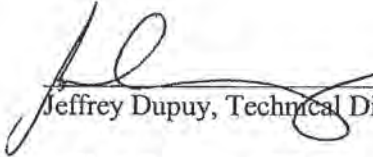
Standard Operating Procedure

SOP -003 rev 1.2

BOD5 and CBOD5 Analyses

**Curtis Environmental Services, Inc.
185 Belle Terre Blvd., Suite D
LaPlace, LA 70068**

Approvals


Jeffrey Dupuy, Technical Director

Date: 11/4/24


Paul Stewart, Quality Assurance Manager

Date: 11/4/24

Effective Date: 11/4/2024

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Document Review and Revision Record

Date	Review/Revision	Reviewed by	Record Activity
8/5/19	2020-1	C. Gagnon	Format to LELAP standard and to combine CBOD ₅ and BOD ₅ methods
11/03/2020	2020-2	Charles Jager	Added YSI 4010-3W DO Meter to equipment section, specified that graduated cylinders are class A, corrected DO probe storage instructions, added instructions for replacement DO probe sensor cap
08/25/2022	1.0	P. Stewart	Updated to meet the requirements of Standard Methods-2016 in accordance with MUR 2021
11/02/2022	1.1	P. Stewart	Grammatical errors fixed, update QA manager
10/23/2023	Review	PS	Reviewed, no updates
11/04/2024	1.2	PS	Reviewed, minor corrections

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1. Identification the test method

- 1.1. The biochemical oxygen demand (BOD) and carbonaceous biological oxygen demand (CBOD) determinations are empirical tests in which standardized laboratory procedures are used to determine the relative oxygen demands of waste waters, effluents, and polluted waters.
- 1.2. The only difference between BOD and CBOD is that a nitrification inhibitor is also used in the CBOD test procedure.

2. Applicable matrix or matrices

This method applies to analyses of wastewaters, effluents, and polluted waters.

3. Detection Limit

- 3.1. A true method detection limit (MDL) cannot be determined for the BOD test; therefore, the MDL is set at 0.20 mg/L, since this is the maximum allowable depletion for dilution water blank.
- 3.2. The practical quantitation limit (PQL) is set at 2.0 mg/L because of the 2.0 mg/L minimum depletion method requirement.

4. Scope of Application

- 4.1. The test has its widest application in measuring waste loadings to treatment plants and in evaluating the BOD removal efficiency of such treatment systems.
- 4.2. The test measures the molecular oxygen utilized during a 5 day incubation period for the biochemical degradation of organic material (carbonaceous demand) and the oxygen used to oxidize inorganic material such as sulfides and ferrous iron.
- 4.3. It also may measure the amount of oxygen used to oxidize reduced forms of nitrogen (nitrogenous demand) unless their oxidation is prevented by an inhibitor, in which case the results would be reported as carbonaceous biochemical oxygen demand (CBOD₅).
- 4.4. Organic waste in sewage is one of the major types of water pollutants. BOD is also an indirect measure of the total amount of biodegradable organics in water. More organics in the sample will result in more BOD exerted.
- 4.5. The seeding and dilution procedures provide an estimate of the BOD at pH 6 – 8.

5. Summary of Method

- 5.1. The method consists of filling an airtight bottle of the specified size with sample and incubating at $20 \pm 1^\circ\text{C}$ for 5 days. Dissolved oxygen is measured initially and after incubation, and the BOD is computed from the difference between initial and final DO. **If only carbonaceous demand is to be determined, a nitrification inhibitor is added to the samples as a special seed mixture.** Because the initial D.O. is determined shortly after the dilution is made, all oxygen uptake occurring after this measurement is included in the BOD measurement.
- 5.2. Because it is necessary to have present a population of microorganisms capable of oxidizing the biodegradable organic matter in the sample, samples that do not contain satisfactory microbial populations (disinfected wastes, high-temperature wastes, or wastes with extreme pH values) must be seeded by adding a population of microorganisms. The DO uptake attributable to the seed is corrected for by using a seed control.
- 5.3. A seed containing nitrification inhibitor is added when CBOD is the desired analysis.

6. Definitions

- 6.1. BOD = Biochemical Oxygen Demand
- 6.2. CBOD = Carbonaceous Biochemical Oxygen Demand

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- 6.3. DO = Dissolved Oxygen
- 6.4. IDO = Initial Dissolved Oxygen (DO measurement taken on the first day of the test)
- 6.5. FDO = Final Dissolved Oxygen (DO measurement taken on the final day of the test)
- 6.6. 2 – 1 Rule = The 2 – 1 Rule refers to the method requirement that for a test bottle to be considered valid, it should have a minimum depletion of 2.0 mg/L after a 5 day incubation period and at least 1.0 mg/L residual D.O. for the final reading

7. Interference

- 7.1. A number of factors, for example, soluble versus particulate organics, settleable and floatable solids, oxidation of reduced iron and sulfur compounds, or lack of mixing may affect the accuracy and precision of BOD measurements. Presently, there is no way to include adjustments or corrections to account for the effect of these factors.
- 7.2. Extremes in pH can have an effect on the growth of the microbes and so can the presence of residual chlorine. These are checked before the test begins and adjusted or removed if necessary.
- 7.3. Samples that are exposed to light during the five day incubation period may photosynthetically produce dissolved oxygen. Avoid this problem by leaving samples in darkness during incubation.
- 7.4. When deionized water is used as the source of dilution water, contamination with soluble organics leached from the resin bed is possible.
- 7.1. Samples supersaturated with dissolved oxygen -- Samples from cold waters may contain more than DO 9 mg/L L at 20 °C. To prevent loss of oxygen during incubation of such samples, reduce the DO level by bringing sample to about 20 °C in a partially filled bottle while agitating by vigorous shaking, stirring, or by aerating with clean, filtered compressed air.
- 7.2. Excess Na₂SO₃ (Sodium Thiosulfate - Dechlorinating agent) exerts an oxygen demand, so do not add more than necessary.
- 7.3. Oxidation of reduced forms of nitrogen, such as Ammonia Organic Nitrogen, can be mediated by microbes and exert nitrogenous demand. Nitrogenous demand has been considered an interference in the determination of BOD as evidenced by the inclusion of ammonia in the dilution water. Nitrogenous demand can be estimated by ammonia nitrogen determinations. Nitrifiers are not usually found in sufficient numbers in raw or primary settled sewage. Add nitrification inhibitor to remove nitrogenous demand and report results as CBOD. This step is 14.9 in the procedure. It is the only difference of BOD and CBOD.
- 7.4. Bottles must be scrupulously clean.

8. Safety

- 8.1. The analysis of environmental samples involves worker contact with samples that may be contaminated with agents that present microbiological hazards. The majority of these agents involve exposure to pathogenic microorganisms or viruses that may produce human disease by accidental ingestion, inoculation, injection, or other means of cutaneous penetration. The primary means of exposure to these microbiological hazards involves hand-mouth contact while handling the samples, contaminated laboratory materials. Use the following rules, work practices and/or procedures to control or minimize exposure to these agents.
- 8.2. Always wear safety glasses, gloves, and/or approved equipment. Avoid contact with all reagents and samples as burns may result. If contact is made, wash all contacted areas with large volumes of water.
- 8.3. Review the MSDS for all chemicals before starting any analyses.
- 8.4. Never mouth pipet the samples.

9. Equipment and Supplies

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- 9.1. Class A assorted pipets and graduated cylinders
- 9.2. 300mL BOD bottle
- 9.3. YSI MultiLab 4010-3 Dissolved Oxygen meter with probe(s)
- 9.4. YSI MultiLab 4010-3W Dissolved Oxygen meter with probe(s)
- 9.5. Stoppers, plastic bottle caps
- 9.6. Incubator at 20°C ± 1°C
- 9.7. Max/min NIST traceable thermometer
- 9.8. pH meter and probe
- 9.9. Diaphragm air compressor with a carbon filter attached to the discharge line.
- 9.10. Pipettes
- 9.11. Class A Graduated cylinders

10. Reagents and Standards

- 10.1. Deionized water
- 10.2. HACH BOD nutrient pillow (to treat 19L)
- 10.3. 1N H₂SO₄
- 10.4. 1N NaOH
- 10.5. 0.024N sodium sulfite solution
- 10.6. Glucose/glutamic acid solution: A 200ppm Glucose-Glutamic acid is purchased from Fisher Scientific. A blank, seeded blank, seed correction (15mL & 25mL), duplicate, Standard (6mL) in at least three bottles. Seed correction must be between 0.6 to 1.0 mg/L.
- 10.7. Polyseed for BOD.
- 10.8. Polyseed NX for CBOD. This seed contains: Nitrification Inhibitor, 2-chloro-6-(trichloromethyl) pyridine.

11. Preparation, Sample collection, preservation, shipment and storage

- 11.1. Dilution water aeration: Fill the water jug with nanopure water to the 19L mark. Aerate the bottle of water to DO 7.8 to 8.2 to prevent over saturation.
- 11.2. Seed preparation: Start with a clean, well rinsed flask. Pour 500 mL of buffered dilution water into the flask per capsule of seed. The buffered water must have a pH of 7.0 to 7.2, and the water must be neutralized to this pH range. Aerate and stir the seed for at least an hour before using it. After the hour, let the mixture set for 15 minutes. Decant only the liquid layer into a beaker leaving the solids. Let the liquid settle for another 5 to 10 minutes. Pipet 4 mL of seed into each BOD bottle that needs seed. To avoid pipetting solids, do not pipet from the bottom of the beaker. This seed is good for six (6) hours. After six hours, a new seed correction solution needs to be started.
- 11.3. Standard: Glucose/Glutamic acid solution must be stored at ≤ 6°C, but warmed to room temperature before usage. Three bottles with 6mL of GGA in each.
- 11.4. Sample Collection & Handling: Sample must be taken in a clean wide mouth plastic bottle. Chain of custody filled out with the date & time. 48-hour holding time. For best results, deliver samples within 6 hours after collection.
- 11.5. Sample Preservatives & Storage: Refrigerate on ice in field and stored in non-acid refrigerator in lab at above 0 - 6 °C
- 11.6. Sample Chain of Custody: Chains must be filled out completely and match the labels. See QSOP100.

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- 11.7. **Maximum holding time is 48 hours after collection.** For composite samples, start the measurement of holding time from the end of composting period.

12. Quality Control

- 12.1. The lot numbers for the standards, seeds, nutrients, and reagents used are recorded. The CBOD Incubator ID that is to be used is also recorded. When using permitted samples, randomly select routine samples to be analyzed twice. Process duplicate sample independently through the entire sample preparation and analysis procedure
- 12.2. **Negative Control.**
- 12.2.1. Run a dilution water quality check with every run. This check should contain only dilution water and nitrification inhibitor. Do not add seed.
- 12.2.2. The Method Acceptance Limit for the blank is ≤ 0.2 mg/L and preferably not more than 0.1 mg/L.
- 12.3. **Positive Control**
- 12.3.1. Dilution water quality, seed effectiveness, and analytical technique are checked using a glucose-glutamic acid solution with every run.
- 12.3.2. The method acceptance limit of this standard should be 198 ± 30.5 mg/L.
- 12.3.3. Dilute Hach's GGA Solution by adding equal amounts of Hach GGA to deionized water. Pipet 6 mL of this solution per 300 mL of dilution water.
- 12.3.4. If the Glucose/Glutamic Acid (GGA) Standard exceeds method acceptance limits, report batch results with a "J" qualifier and the following comment: "GGA control sample result was ## ppm. The control sample acceptance limits are 198 ± 30.5 ppm."
- 12.4. **Accuracy**
- 12.4.1. Use the percent recovery on the glucose-glutamic acid standard to analyze accuracy by averaging the values obtained for the two bottles containing reference standard and accessing accuracy.
- 12.5. **Precision**
- 12.5.1. To assess precision, perform duplicate analysis on one sample dilution for each analytical batch. Use analyzed concentrations to assess precision.
- 12.5.2. The acceptance RPD limit is $\leq 20\%$
- 12.5.3. If the RPD exceeds the acceptable RPD, qualify the results with an appropriate data qualifier and comment.

13. Calibration and Standardization

- 13.1. A 200 ppm Glucose-Glutamic acid is purchased from Fisher Scientific. A blank, seeded blank, seed correction (15mL & 25mL), duplicate, and standard (6mL) of GGA in three bottles. Seed correction must be between 0.6 and 1.0.
- 13.2. Requirements: The serial number of the DO meter used must be recorded on the batch sheets.
- 13.2.1. All batch sheets, permitted or non-permitted must have the following information added to the sheet:
- 13.2.1.1. DO Blank
- 13.2.1.2. DO Seeded Blank
- 13.2.1.3. DO Seed Correction
- 13.2.1.4. Type of Seed (Polyseed or Polyseed NX)
- 13.2.2. This information will be need for documentation, is case of a problem in the future. The information will be at hand, so that there will be no confusion as to what figures were used by the technician. Remember, if a mistake is made on the batch sheet do not scratch out, but draw a line thru and initial. Each sheet must be labeled with the standard ID #, that is, if a standard is used for Bottle #1, Std #1 must be printed on all sheets using the dilution water for Bottle #1.

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- 13.2.3. At least one sheet of that day's batches must have the temperature of the water and the dissolved oxygen recorded on the sheet. For troubleshooting purposes, record the temp/DO of the water taken from the incubator. All initial D. O.'s, must be checked, so that no DO's are over the saturation limits of that temperature. Example: If the temperature is 24 C, the DO cannot be above an 8.5 mg/l
- 13.2.4. All equipment must be clean and free of soap residue. Soap causes low CBODs.
- 13.3. Calibration
 - 13.3.1. Use the YSI MultiLab 4010-3 and/or YSI MultiLab 4010-3W DO meter(s).
 - 13.3.2. Record any maintenance of the meter in the DO Meter Logbook.
 - 13.3.3. Replace the sensor cap on the probe every six months and enter the corresponding coefficient. (See page 91 of the YSI MultiLab 4010-3(W) User Manual for details)
 - 13.3.4. Gently tap the cap to dislodge any bubbles adhered to the inside of the cap. Tilt the probe to the side as the cap is screwed back on the probe to allow for the air to escape.
 - 13.3.5. Place the probe in the BOD bottle (make sure the bottle is saturated).
 - 13.3.6. Press the "Cal" button on the meter.
 - 13.3.7. Once the readout stabilizes, the meter will display the slope and calibration record. Press the "Measure" button to bring the meter into the measuring mode.
 - 13.3.8. To measure the DO in a BOD bottle, place the probe in the bottle and flip the stirrer switch.
 - 13.3.9. Once the reading on the meter stabilizes, it will display the DO.

14. Procedure

- 14.1. Prepare the aerated dilution water by adding one HACH BOD nutrient pillow for each 19 liters of dilution water bottle. The dilution water bottle shall have a temperature of $20^{\circ}\text{C} \pm 1^{\circ}\text{C}$. Check dilution water pH; must be in the range of 7.0 to 7.2. The DO must be 7.8-8.2 ppm (check the temperature/DO chart for saturation range). After mixing, store in an incubator at $20^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for use. Start seeded solution with this buffered water, as mention above. Samples must be warmed to around $20 \pm 3^{\circ}\text{C}$. Record temperature and DO of the water on batch sheet.
- 14.2. Check each sample for total residual chlorine (TRC) and pH. The sample must not have any TRC and the pH must be in the range of 6.5 to 7.5. Adjust the pH using NaOH to raise the pH and diluted H₂SO₄ to lower the pH. Record this adjustment in the BOD lab station logbook with sample ID, date, original pH, the amount added to adjust the pH. To remove chlorine make- up a solution of sodium sulfite (1.575g to 1000mL) and add 6-7 mL of solution for each ppm of TRC. If an excessive amount of sodium sulfite solution is added the sample's DO must be checked. If it is below 7.5, the sample must be aerated and rechecked. This must be repeated until the DO is at the acceptable level.
- 14.3. NOTE: When testing for the SOLUBLE BOD, a portion of the sample must be filtered through a pre-washed TSS filter into a clean vacuum flask. The filter is discarded and the filtrate in the flask is retained to test as per the normal BOD procedure. Be sure to filter enough sample for the dilutions needed.
- 14.4. Determine the amount of volume needed for each sample to be tested and put it on the BOD bottles with the name of the sample. At least three dilution bottles must be used for each sample. If any doubt about the range of BOD more sample dilution must be used or a TOC / COD could be run to find the range. Try to select a volume to yield a 4ppm DO reduction. **When a BOD bottle contains more than 67% of sample after dilution, nutrients may be limited in the diluted sample and subsequently reduce biological activities. In such sample, add the nutrients, minerals, and buffer solution directly to the diluted sample at a rate of 1 mL per liter.**
- 14.5. Begin adding the portion of sample to each BOD bottle according to the planned dilution.

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- 14.6. For each batch of permitted samples a set of QA samples must be run. Two blanks, two seed blanks, at least two seed corrections, three GGA standards of 198 mg/L
- 14.7. Set up BOD bottles in rows. The first row will contain 2 bottles and is used for the method blank. The second row will contain 4 bottles and is used for the seed control series. The third row will contain 3 bottles to be used for QC reference standard. The reference standard used is Glucose/glutamic acid standard. The remaining rows will be for samples and the amount of bottles in them will depend on the sample source. Refer to **Table 1** for number of dilutions. Dilutions may need to be adjusted if TSS, COD or NH₃-N of the sample is/are significantly higher or lower than normal. Place bottle numbers next to corresponding samples on worksheet.
- 14.8. Add 4mL of the Polyseed solution to each BOD bottle except for the blanks and seed correction bottles. The blank water does not get any seed and the seed correction bottles must get 15mL & 25mL.
- 14.9. Add 4mL of the Polyseed NX solution to each BOD bottle except for the blanks and seed correction bottles. The blank water does not get any seed and the seed correction bottles must get 15mL & 25mL. Use this step only if CBOD procedure is being run.
- 14.10. Fill the BOD bottles with the buffered dilution water. To prevent any air bubbles from collecting on the inside of the BOD bottles, this is done by keeping the tip of the filling tube submerged approximately ½ to 1 inch below the surface of the water as the bottle fills. The bottles must be filled to the bottom part of the flared top. The filler tube used to transfer the buffer may be directly inserted into a replicate of the same sample or of high concentration, but must be rinsed between samples when inserting into lower concentration's of a replicate sample or when filling a new sample.
- 14.11. After the BOD bottles are filled with dilution water, insert the DO probe into the BOD bottle. Slowly insert the calibrated DO probe and record the DO of each sample. The DO reading must be stable before moving on to the next sample. The DO probe must be in the mg/L mode when reading the DO. The D.O. probe used to read the samples may be directly inserted into a replicate of the same sample or of high concentration, but must be rinsed between samples when reading lower concentration's of a replicate sample or when filling a new sample. *Read the DO of the bottles for one batch sheet at a time, before starting the next batch sheet.*
- 14.12. After reading each BOD bottles, insert the glass BOD stopper into the BOD bottle slowly, so that no air bubbles are trapped in the bottle.
- 14.13. The BOD bottles must have a water seal from the remaining sample left in the flared end of the BOD bottle. Place a BOD cap on each BOD bottle.
- 14.14. Place the BOD sample bottles into the incubator for 5 days ± 6 hours, making sure that the temperature is 20± 1 degrees C. Temperature readings on BOD incubators and refrigerators should continuously be recorded daily.
- 14.15. After five days ± 6 hours, remove the BOD samples from the incubator to read the final DO. Record the reading on the batch sheet, so that all the information is handy for calculating the results.
- 14.16. The batch sheet must have all the appropriate information on it. Start date & time, end date, amount of seed used, calibration reading and temperature, analyst initials, amount of sample used and initial and final DO.
- 14.17. The BOD of the blank must not exceed the value of 0.2 mg/L. The seed correction must be in the range of 0.6 to 1.0. Use the volume that gives this value. **All seed correction information must be reported on each batch sheet for calculating permitted and non-permitted samples.**
- 14.18. Use the CBOD/BOD calculation program in Excel to calculate the CBOD/BOD results for each dilution analyzed. If all dilution results meet the acceptance criteria as stated in the Data Assessment & Acceptance Criteria for QC Measures section of this procedure, report

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the average of the results. If one of the results does not meet the acceptance criteria, then it may be omitted and the average of the remaining results is reported. Record the seed correction factor used for calculating the CBOD/BOD.

- 14.19. Store probe in probe in 300 mL BOD bottle containing 40 mL of reagent water.
- 14.20. If you get bad or high readings, change membrane sensor caps.

15. Data analysis and calculations

15.1 $CBOD/BOD, \text{ mg/L} = [(A-B) - (C-D) t] / P$

A = Final DO of diluted sample immediately after preparation (mg/L)

B = Final DO of diluted sample after 5 day incubation at 20°C (mg/L)

C = DO of seed control before incubation (mg/L)

D = DO of seed control after incubation (mg/L)

t = ratio of seed in diluted sample to seed in seed control

P = volumetric fraction of sample seed

- 15.2 Use no less than 2 dilutions that meet Standard Methods criteria to calculate the BOD. The final BOD should be arithmetic average of all qualified dilution results. If the final DO after 5-day incubation is less than 1 mg/L, the BOD/CBOD value is > the calculated value of the lowest dilution.

- 15.3 If all dilutions result in a DO depletion of <2.0mg/L and the sample was diluted, select the bottle with the largest volume (least diluted) and calculate the report as if the dilution had depleted 2.0mg/L

16. Method performance

- 16.1. See Standard Methods 5210B-2016, section 8.
- 16.2. This laboratory SOP is based on an existing EPA approved method.

17. Pollution prevention

- 17.1. Pollution prevention in the laboratory is the preferred approach in managing laboratory waste. Minimizing waste makes good economic sense: it reduces both costs and liabilities associated with waste disposal
- 17.2. Purchase the quantity of chemicals based on expected usage during its shelf life and disposal cost of unused material. Actual reagent preparation volumes should reflect anticipated usage and reagent stability
- 17.3. Substitute nonhazardous material for hazardous chemicals where possible. Wherever possible use methods that do not require the use of hazardous chemicals or use micro-scale analytical method
- 17.4. Improving laboratory procedures, documentation, and training will increase awareness of waste minimization and proper disposal practices
- 17.5. For information about pollution prevention that may be applicable to laboratories and research institutions, consult *Less is Better: Laboratory Chemical Management for Waste Reduction*, available from the American Chemical Society's department of Government Regulations and Science Policy, 1155 16th Street N.W., Washington D.C., 20036

18. Data assessment and acceptance criteria for quality control measures

- 18.1. Data shall be reportable with no cautionary flags if the following criteria
 - 18.1.1. The acceptance criterion for the blank of a batch must be -0.05 to 0.2 ppm.
 - 18.1.2. The acceptance criteria for the laboratory control sample

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- (LCS/GGA) of a batch shall be within 198 ± 30.5 mg/L.
- 18.1.3. The acceptance criteria for the precision between sample and lab duplicate (RPD) of a batch shall be within designated control limits.
- 18.1.4. The seed correction acceptable limits are 0.1 – 1.0 mg/L.

19. Corrective action for out-of-control or unacceptable data

- 19.1. QC data this is outside the acceptance limits or exhibit a trend, are evidence of unacceptable errors in the analytical process. Take corrective action promptly to determine and eliminate the source of the error.
- 19.2. Review out of control Data
- 19.3. Split samples with other capable analysts
- 19.4. Analyze additional QC samples
- 19.5. Check for proper 20 temperature in incubator.
- 19.6. Initial DO readings should be within 7.5 – 9.5 mg/L
- 19.6.1. If DO readings are too high
- 19.6.1.1. Samples or dilution water may be supersaturated with oxygen.
- 19.6.1.2. Make sure samples are within $20 \pm 3^\circ\text{C}$
- 19.6.1.3. Shake vigorously or aerate to reduce DO level
- 19.6.1.4. Also check meter calibration. How old is filling solution? Change filling solution if you are not sure or if it is over a month old.
- 19.6.2. If readings are too low
- 19.6.2.1. Sample or dilution water may need to be aerated to increase the DO
- 19.6.2.2. Is the probe stirrer working properly?
- 19.7. Dilution water blanks exceeding method and/or historical limits.
- 19.7.1. If DO depletion in blank is excessive only periodically, suspect lab procedures, calibration, contamination, equipment failure, or lapse in procedure may be the cause.
- 19.7.2. Check cleanliness of BOD bottles (consider purchasing disposables and do not reuse.)
- 19.7.3. Change filter on outlet of deionized water system
- 19.7.4. Make sure dilution water carboy is clean and sterile before using for a new batch of dilution water
- 19.7.5. Allow the deionized water to age in the dark, loosely capped, 5 to 7 days, but not more than 10 days before use
- 19.7.6. Dilution water should only be stored in glass or Teflon (If possible). Plastic containers may leach oxygen demanding material.
- 19.7.7. Initial DO of dilution water was > 9.2 mg/L. Never begin the BOD analysis if the DO of the dilution water or samples is greater than 9.2 mg/L. The ideal range is 7.5 to 8.5 mg/L. The DO can be reduced by shaking or aerating the dilution water then letting it set for 30 minutes before use. Recheck the DO again. Be sure the temp of the dilution water is $20 \pm 3^\circ\text{C}$ before beginning the analysis.
- 19.7.8. Check the membrane on the DO probe. Make sure it is in good shape with no bubbles under the membrane and fresh filling solution.
- 19.8. Glucose – Glutamic Acid Standard exceeding method limits.
- 19.8.1. GGA Standard may be expired or ineffective. Replace with a new lot number.
- 19.8.2. High GGA values may indicate contamination of dilution water or high seed values or too much seed added
- 19.8.3. Low GGA values may indicate poor seed quality, not enough seed added or toxicity.
- 19.9. All dilutions of a sample produce less than required DO depletion of 2.0 mg/L.
- 19.9.1. Sample concentrations used may be too low. Increase sample concentration.
- 19.9.2. Toxicity in sample.
- 19.9.3. Did you check the sample for chlorine residual and remove it? Did you document?

Curtis Environmental Services, Inc.	Test Procedures
BOD5 and CBOD5 Analyses	SOP – 003 rev 1.2
	Effective Date: 11/4/2024
Confidential	

- 19.9.4. Did you check the sample pH and adjust? Did you document?
- 19.10. Poor precision
- 19.10.1. Failure to mix between multiple dilutions of a single sample.
- 19.10.2. Inadequate mixing – samples should be thoroughly mixed and rapidly transferred to the BOD bottles to prevent samples containing high solids concentrations from settling out.
- 19.10.3. Using the wrong type of pipets or volumetric apparatus. Use pipets with large tip openings to facilitate a representative subsampling,
- 19.11. All dilutions of a sample produce less than required residual DO of 1 mg/L.
- 19.11.1. Sample concentration too high.
- 19.11.2. Decrease sample concentration.
- 19.12. Bubbles appear in BOD bottles after incubation.
- 19.12.1. Samples supersaturated – initial DO was > 9.2 mg/L.
- 19.12.2. Do not begin analysis until the DO of the sample is < 9.2 mg/L, ideally 7.5 – 8.5 mg/L.
- 19.12.3. Temperature of the sample was $< 20^{\circ}\text{C}$.
- 19.12.4. Do not begin analysis until the sample temp is $20 \pm 3^{\circ}\text{C}$.
- 19.13. Reverse Depletion – The depletion of the more concentrated sample is less than the depletion of the least concentrated sample.
- 19.13.1. Toxicity
- 19.13.2. Check sample or seed for pH (6 – 8) adjust if necessary and document.
- 19.13.3. Check sample for Cl_2 residual and dechlorinate if necessary. Document.

20. Contingencies for handling out-of-control or unacceptable data

- 20.1. A new set of standard must be run, after corrective action was taken. Fill out a QA/QC Failure Corrective Action Report and give to supervisor. Refer to *CES ASOP-010: Requirements for the Corrections on Documentation*.

21. Waste management

- 21.1. Flush sample and unused standards in the sink under a hood with plenty of water.

22. Reference

- 22.1. Standard Methods for the Examination of Water and Wastewater 5210 B-2016.

23. Any table, diagram, flowcharts and validation data

- 23.1. Click here to enter text.

1.

BOD Bench Sheets

April, May, June, & July

2022, 2023, & 2024

START DATE: 4-6-22
END DATE: 4/11/22

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND
SM 5210 B, 22nd ED

CURDATE: 04/06/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 135967

[illegible]

CURDATE: 04/06/2022

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 135967

[illegible]

4/13/22
4/18/22

LAB WORKSHEET
OXYGEN DEMAND
SM 5210 B, 22nd ED

04/13/2022

VOLUME OF DILUTION $H_2O = 19L$

136105

[illegible]

4/13/22
4/18/22

LAB WORKSHEET

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L

SM 5210 B, 22nd ED

WORKSHEET BATCH NO. 136105

CURDATE: 04/13/2022

VOLUME OF DILUTION $H_2O = 19L$

VOLUME OF SEED = 4 mL.

[illegible]

START DATE: 4/20/22
END DATE: 4/25/22

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED

CURDATE: 04/20/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 136247

[illegible]

20/22
4/25/22

LAB WORKSHEET
OXYGEN DEMAND
SM 5210 B, 22nd ED

CURDATE: 04/20/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 136247

[illegible]

4/27/22
5/2/22

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED.

CURDATE: 04/27/2022

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

SM 5210 B, 22nd ED
WORKSHEET BATCH NO. 1

[illegible]

CURDATE: 04/27/2022
VOLUME OF DILUTION H₂O = 1
VOLUME OF SEED = 4 mL

[illegible]

5/9/22

LAB WORKSHEET

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED

WORKSHEET BATCH NO. 136499

05/04/2022

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

[illegible]

5/4/22

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED

05/04/2022

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 136499

CURDATE: 05/11/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

Incubator ID:	Temp °C min/max:	5	7.0	↓	↓	Reviewed by: CAS 05/13/2022
pH Slope = 1.0 ± 0.06				pH Slope = 100.3		Form # 32, Revision 2.0
% STD = 167.5-228.5				% Seed Correction (0.6 - 1.0) = 0.77		

CURDATE: 05/18/2022

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 136786

[illegible]

CURDATE: 05/18/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START SAMPLE TIME	RAW DO TEMP.	SAMPLE VOLUME	FINAL TIME	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
						MAX=200mL	D.O., mg/L	D.O., mg/L	(mg/L)	
DOBLKH20	05/16/2022 10:30	[REDACTED]	2	B	B	8.1	8.1	8.0	0.05	[REDACTED]
DOSEDBK	05/16/2022 10:30	[REDACTED]	3	SB	SB	8.1	8.1	7.1	1.00	[REDACTED]
DOSECOR	05/16/2022 10:30	[REDACTED]	X	IS	IS	8.1	8.1	4.6	0.93	0.98
OV_BOD	05/16/2022 10:30	[REDACTED]	Y	25	100	200	8.1	8.5	9.0	<1.5
DUPLICATE	05/16/2022 10:30	[REDACTED]	Z	25	100	200	8.2	8.5	9.0	<1.5
BODSTD	05/16/2022 10:30	[REDACTED]	V	6	8	6	8.1	8.1	8.1	13.7
PRECISION	05/16/2022 10:30	[REDACTED]	-	-	-	-	-	-	0	[REDACTED]
pH meter S/N: K18032 , pH 4.00 Buffer Lot # 217475 Jug# pH T°C D.O.										
pH probe S/N: ZQ1-15967, pH 7.00 Buffer Lot # 217473 7.1 ±0.1 20 ±3 8.0 ±0.2										
GGA Lot #:	1201905	pH 10.00 Buffer Lot # 217472	1	7.1	23	8.1				YSI 4010-3W (BOD 1): 21330228
Seed Lot #:	26010212105	Pipette S/N: SH67132	2	7.0	1	7.8				YSI 4010-3W (BOD 2): 21271718
Na2SO3 Lot #:	203497	BOD Buffer Lot #: A1315	3	7.1	1	7.9				YSI 4010-3W (BOD 3): 22070334
DPD Lot #:	A2004	Purelab Classic Ohms: 18.2	4	7.2	↓	8.0				
Incubator ID:	1	Temp °C min/max: 20/20.2	5	-	-	-				
Reviewed by: CAS 05/24/2022										
Form # 32, Revision 2.0										

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED
WORKSHEET BATCH NO. 136920

05/26/2022

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 136920

[illegible]

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED

05/26/2022

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 136920

[illegible]

CURDATE: 06/02/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJODWD	06/01/2022 15:00	AI00769		43/84	20	1		18 50 100	8.0	8.5	5.03.6	12 CAT 260014-01

CURDATE: 06/02/2022

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 137026

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	RAW DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	06/01/2022 08:00	[REDACTED]	—	—	2		B	7.9	7.7	0.15	[REDACTED]
DOSEEDBK	06/01/2022 08:00	[REDACTED]	—	—	3		SB	7.9	7.0	0.90	[REDACTED]
DOSEDCOR	06/01/2022 08:00	[REDACTED]	—	—	X		IS	7.8	4.7	0.83	[REDACTED]
OV_BOD	06/01/2022 08:00	[REDACTED]	—	—	B		100	8.0	6.6	11	[REDACTED]
DUPLICATE	06/01/2022 08:00	[REDACTED]	—	—	C		100	8.0	6.4	11	[REDACTED]
BODSTD	06/01/2022 08:00	[REDACTED]	—	—	Y		666	7.8	2.9	190	[REDACTED]
PRECISION	06/01/2022 08:00	[REDACTED]	↓	—	—	→	—	—	—	0	[REDACTED]
pH meter S/N: K18032 , pH 4.00 Buffer Lot #:		—	Jug#	pH	T°C	D.O.	DO Meter S/N				
pH probe S/N: ZQ1-15967, pH 7.00 Buffer Lot #:		—	7.1 ±0.1	20 ± 3	8.0 ±0.2		YSI 4010-3W (BOD 1): 21330228				
GGA Lot #:		—	1	—	—	—	YSI 4010-3W (BOD 2): 21271718				
Seed Lot #:		—	2	—	—	—	YSI 4010-3W (BOD 3): 22070334				
Na2SO3 Lot #:		—	3	—	—	—					
DPD Lot #:		—	4	—	—	—					
Incubator ID:		—	5	—	—	—					
% STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) =		—					0.73				
pH Slope =		—									
DO Slope =		—									
Reviewed by: GAT oc/oc/2022											Form # 32, Revision 2.0

START DATE: 6/8/22
END DATE: 6/13/22

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(S-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED
WORKSHEET BATCH NO. 137155

CURDATE: 06/08/2022
VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	06/07/2022 08:00	AI01510	15:00	6.5	18	1	10	1008.0	7.9	7.9	7.9	0.00
DOSEEDBK	06/07/2022 08:00					A	58	58	7.9	7.5	7.3	0.50
pH meter S/N: K18032, pH 4.00 Buffer Lot #: 220001												
pH probe S/N: ZQ1-15967, pH 7.00 Buffer Lot #: 217473												
GGA Lot #: 1201905, pH 10.00 Buffer Lot #: 217042												
Seed Lot #: 312105, Pipette S/N: SH67132												
Na2SO3 Lot #: 203490, BOD Buffer Lot #: A2035												
DPD Lot #: A1350, Purelab Classic Ohms: 18.2												
Incubator ID: 1, Temp °C min/max: 19.9/20.3												
DO Slope = 1.0 ± 0.06, pH Slope = 101.9												
%, STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = 0.96												
Reviewed by: 6/13/2022												
Form # 32, Revision 2.0												

CURDATE: 06/08/2022

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 137155

[illegible]

Reviewed by: CAJ 06/13/2022
Form # 32, Revision 2.0

CURDATE: 06/15/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	06/14/2022 11:00					Z		B	7.8	7.8	0.00	
DOSEEDBK	06/14/2022 11:00					A		SB	7.9	7.1	0.75	
DOSEDCOR	06/14/2022 11:00					B		IS	7.9	2.5	0.80	
OV_BOD	06/14/2022 11:00					C		25	8.1	6.6	2	
DUPLICATE	06/14/2022 11:00					I		25	8.1	6.6	2	
BODSTD	06/14/2022 11:00					C		6	7.9	3.3	1.91	
PRECISION	06/14/2022 11:00										0	

CURDATE: 06/22/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

[illegible]

START DATE: 6/22/22
END DATE: 6/27/22

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED
WORKSHEET BATCH NO. 137421

CURDATE: 06/22/2022
VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	06/21/2022 08:00					1		B	8.0	8.0	0.00	
DOSEDEBK	06/21/2022 08:00					2		SB	8.0	7.4	0.60	
DOSEDCOR	06/21/2022 08:00					3		AS	8.0	8.4	2.7	
OV BOD	06/21/2022 08:00					2		AS	8.0	5.1	2.9	
DUPLICATE	06/21/2022 08:00					3		AS	8.0	5.0	3.1	
BODSTD	06/21/2022 08:00					X		6	8.0	3.5	184	
PRECISION	06/21/2022 08:00										0	
DO Meter S/N												
pH meter S/N: K18032, pH 4.00 Buffer Lot #: _____												
pH probe S/N: ZQ1-15967, pH 7.00 Buffer Lot #: _____												
GGA Lot #: _____, pH 10.00 Buffer Lot #: _____												
Seed Lot #: _____, Pipette S/N: SH67132												
Na2SO3 Lot #: _____, BOD Buffer Lot #: _____												
DPD Lot #: _____, Purelab Classic Ohms: _____												
Incubator ID: _____, Temp °C min/max: _____												
DO Slope= _____, pH Slope= _____, % STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = <u>0.85</u>												
Reviewed by: <u>LAS 06/27/2022</u> Form # 32, Revision 2.0												

CURDATE: 06/30/2022
VOLUME OF DILUTION H2O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 137556

[illegible]

CURDATE: 06/30/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

[illegible]

CURDATE: 07/06/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 137651

LOC CODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.		
SJODWD	07/05/2022 15:00	A107168		6.1	22	B		8	25	56	79	7.7	52	259327-01
DOBLKH20	07/05/2022 08:30	[REDACTED]		-	-	2		B	8.0	8.0	8.0	8.0	0.0	
DOSEEDBK	07/05/2022 08:30	[REDACTED]		-	-	3		SB	8.0	8.0	7.4	7.0	0.80	
DOSDCOR	07/05/2022 08:30	[REDACTED]		-	-	X		IS	25	29	7.9	3.8	1.8	109 0.98
OV_BOD	07/05/2022 08:30	[REDACTED]		-	-	X		25	100	200	27	7.3	6.8	6.15.3
DUPLICATE	07/05/2022 08:30	[REDACTED] ✓		-	-	Y		✓	25	100	200	27	7.4	6.7
pH meter S/N: K18032 , pH 4.00 Buffer Lot #22000				Jug#	pH	T°C	D.O.	DO Meter S/N						
pH probe S/N: ZQ1-15967, pH 7.00 Buffer Lot #217473					7.1 ±0.1	20 ± 3	8.0 ±0.2	YSI 4010-3W (BOD 1): 21330228						
GGA Lot #: 2204643 , pH 10.00 Buffer Lot #220008				1	7.0	23	8.0	YSI 4010-3W (BOD 2): 21271718						
Seed Lot #: 212105 , Pipette S/N: SH67132				2	7.1		7.9	YSI 4010-3W (BOD 3): 22070334						
Na2SO3 Lot #203490 , BOD Buffer Lot #A2035				3	✓		✓							
DPD Lot #: A2041 , Purelab Classic Ohms: 18.2				4	-		-							
Incubator ID: 1 , Temp °C min/max 20/20.1				5	-		-							
DO Slope = 1.0 ± 0.06 , pH Slope = 101.6 % STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = 0.98														
												Reviewed by:	PS 7/12/22	Form # 32, Revision 2.0

CURDATE: 07/06/2022

VOLUME OF SEED = 4 mL

Form # 32, Revision 2.0

Incubator ID:	170706	Temp °C min/max	20/28
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CURDATE: 07/20/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 137966

[illegible]

07/27/2022

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 138119

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START SAMPLE TIME	SAMPLE DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
			0745	10.3							
SJODWD	07/26/2022 15:00	A111672		6.3	20	B	25 50	7.9 7.8	4.2 1.3	83	262115-01
pH meter S/N: K18032 , pH 4.00 Buffer Lot #: 220001											
pH probe S/N: ZQ1-15967, pH 7.00 Buffer Lot #: 217473											
GGA Lot #: 1201905 , pH 10.00 Buffer Lot #: 220003											
Seed Lot #: 2/2/05 , Pipette S/N: SH67132											
Na2SO3 Lot #: 197418 , BOD Buffer Lot #: A2035											
DPD Lot #: A2041 , Purelab Classic Ohms: 18.2											
Incubator ID: 1/2 , Temp °C min/max: 18.2/20.3/20											
Reviewed by: PS											8/2/22
DO Slope= 1.0 to 0.0, pH Slope= 10.8											
% STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0)= 0.99											
Form # 32, Revision 2.0											

CURDATE: 07/27/2022
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 138119

[illegible]

START DATE: 4/5/2023
END DATE: 4/11/2023

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 04/05/2023

VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 142738

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
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[REDACTED]											
SJODWD	04/04/2023 15:00	AI63400		8.4	20	1	57550	8.282826	04.824	24	265666-01

pH meter S/N: K16822	pH 4.00 Buffer Lot #: 223570	Jug#	pH	7.1 ±0.1	20 ± 3	8.0 ±0.2	DO Meter S/N	YSI 4010-3W (BOD 1): 21330228
pH probe S/N: AR1-16348	pH 7.00 Buffer Lot #: 224883							YSI 4010-3W (BOD 2): 21271718
GGA Lot #: 4106225	pH 10.00 Buffer Lot #: 2211684	1	7.1	23	8.0			YSI 4010-3W (BOD 3): 22070334
Seed Lot #: 2212104	Pipette S/N: SH67132	2			7.9			
Na2SO3 Lot #: 2154428	BOD Buffer Lot #: A21100	3			8.0			
DPD Lot #: A200609	Purelab Classic Ohms: 16.2	4	7.0		8.2			
Incubator ID: 1	Temp °C min/max: 18.9/20.0	5			8.0			
DO Slope= 1.05058	pH Slope= 99.5	% STD= 167.5	228.5	Seed Correction (0.6 - 1.0)= 0.60			Reviewed by: PS 4/11/23	Form # 32, Revision 2.0

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016
WORKSHEET BATCH NO. 142864

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

[illegible]

04/12/2023

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
LAB WORKSHEET
SM 5210 B-2016

CURDATE:

VOLUME OF DILUTION $H_2O = 19L$

VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 142864

[illegible]

START DATE: 4/19/2023
END DATE: 4/19/2023

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 04/19/2023
VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143004

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	04/17/2023 08:00			9.4	19	A		B 13	8.0	8.0	0.16	
DOSEEDBK	04/17/2023 08:00			8.8		B		SB 5B	8.0	7.3	0.7	
DOSEDCOR	04/17/2023 08:00					C		15 25	8.0	4.5	0.107	
OV_BOD	04/17/2023 08:00					2		8 25 50	8.0	2.9	4.1	
DUPLICATE	04/17/2023 08:00			9.4	19	3		8 25 50	8.0	4.1	3.7	
BODSTD	04/17/2023 08:00					1		6 15 30	8.0	3.6	1.90	
PRECISION	04/17/2023 08:00										4	
DO Meter S/N: K16822, pH 4.00 Buffer Lot #: —, D.O. —												
pH probe S/N: AR1-16348, pH 7.00 Buffer Lot #: —, 7.1 ±0.1 20 ± 3 8.0 ±0.2												
GGA Lot #:	—	pH 10.00 Buffer Lot #:	—	1	—	—	—	—	—	—	—	YSI 4010-3W (BOD 1): 21330228
Seed Lot #:	—	Pipette S/N: SH67132	—	2	—	—	—	—	—	—	—	YSI 4010-3W (BOD 2): 21271718
Na2SO3 Lot #:	—	BOD Buffer Lot #:	—	3	—	—	—	—	—	—	—	YSI 4010-3W (BOD 3): 22070334
DPD Lot #:	—	Purelab Classic Ohms:	—	4	—	—	—	—	—	—	—	
Incubator ID:	—	Temp °C min/max:	—	5	—	—	—	—	—	—	—	Reviewed by: 154/25/23
DO Slope=	—	pH Slope=	—	% STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = 0.1								Form # 32, Revision 2.0

START DATE: 7/13/22
END DATE: 7/18/22

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B, 22nd ED

CURDATE: 07/13/2022

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 137793

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.	
SJODWD	07/12/2022 15:00	AI08853	1	3.9/23	23	C	1	5.25	5.8	1.8	8.0	259335-01	
DOBLKH20	07/12/2022 09:15					1		B	B	8.0	7.9	0.05	
DOSEEDBK	07/12/2022 09:15					2		SB	SB	8.1	7.1	1.0	
DOSEDCOR	07/12/2022 09:15					3		15	25	8.1	7.8	0.3	
OV BOD	07/12/2022 09:15					2		15	75	150	8.1	7.8	4
DUPLICATE	07/12/2022 09:15					3		15	75	150	8.1	7.9	3
BODSTD	07/12/2022 09:15					X		6	6	8.0	8.0	3.6	171
PRECISION	07/12/2022 09:15												
DO Meter S/N													
pH meter S/N: K18032	pH 4.00 Buffer Lot #:												
pH probe S/N: ZQ1-15967	pH 7.00 Buffer Lot #:												
GGA Lot #:	pH 10.00 Buffer Lot #:	1											
Seed Lot #:	Pipette S/N: SH67132	2											
Na2SO3 Lot #:	BOD Buffer Lot #:	3											
DPD Lot #:	Purelab Classic Ohms:	4											
Incubator ID:	Temp °C min/max:	5											
DO Slope=	pH Slope=	% STD = 167.5 - 228.5	Seed Correction (0.6 - 1.0) =	1.01									
Reviewed by: PS 7/19/22												Form # 32, Revision 2.0	

START DATE: 4/26/2023
END DATE: 5/1/2023

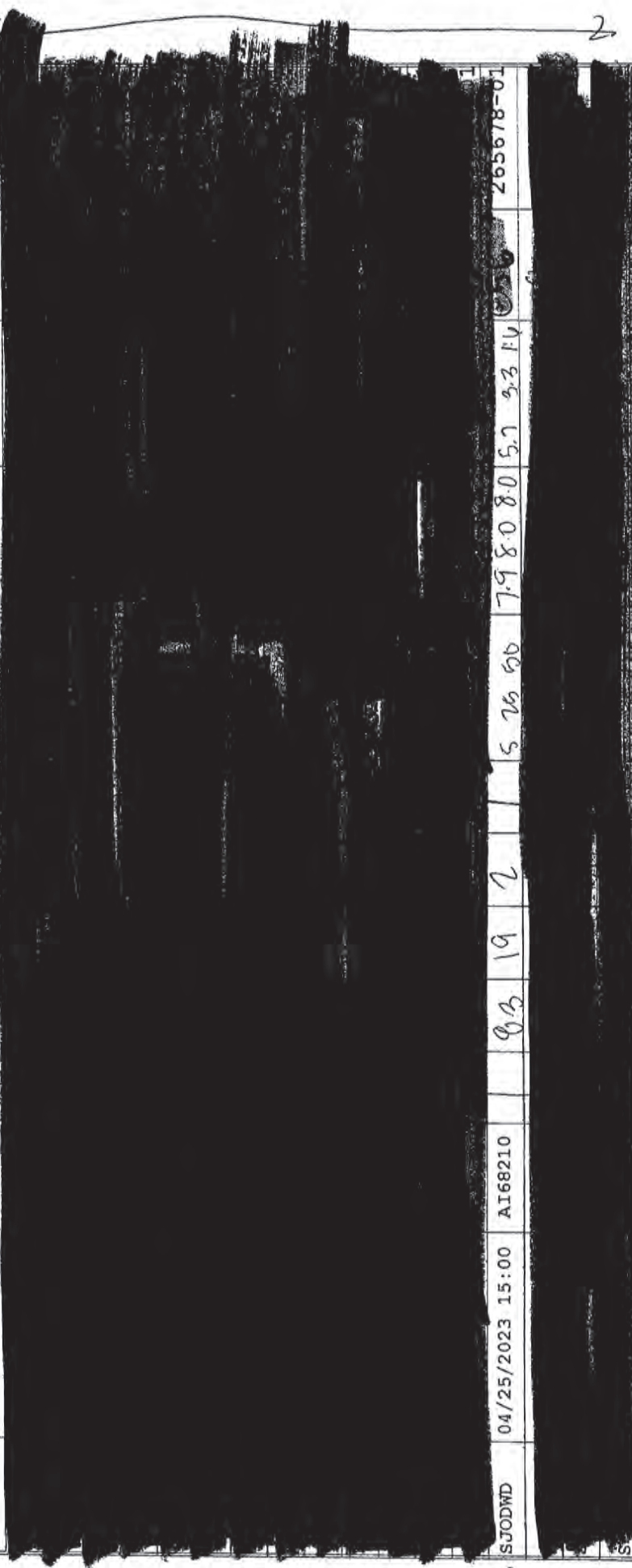
LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 04/26/2023

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143122

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
			7:45					MAX=200mL				



pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 224881		Jug#	pH	T°C	D.O.	DO Meter S/N
pH probe S/N: AR1-16348, pH 7.00 Buffer Lot #: 242000			7.1 ±0.1	20 ± 3	8.0 ±0.2	
GGA Lot #: 2212690 , pH 10.00 Buffer Lot #: 220000		1	7.2	23	8.0	
Seed Lot #: 012205 , Pipette S/N: SH67132		2			7.8	
Na2SO3 Lot #: 05429, BOD Buffer Lot #: A2199		3			7.9	
DPD Lot #: 22205 , Purelab Classic Ohms: 18.2		4				
Incubator ID: 1 , Temp °C min/max: 20.2		5			7.9	
Reviewed by: [Signature]						5/3/2023
Form # 32, Revision 2.0						

DO Slope = 1.0 ± 0.00, pH Slope = 100.1 % STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = 0.75

04/26/2023

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143122

[illegible]

START DATE: 5/3/23
END DATE: 5/8/23

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016
WORKSHEET BATCH NO. 143249

CURDATE: 05/05/2023
VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE DO TEMP, °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
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SJODWD	05/02/2023 15:00	AI69611		8.4	23	C		5	25	50	8.28, 28.2	1.04	1.0	496	270106-01
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pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 224881		Jug#	pH	T°C	D.O.	DO Meter S/N
pH probe S/N: ARI-16348, pH 7.00 Buffer Lot #: 226063			7.1 ±0.1	20 ± 3	8.0 ±0.2	YSI 4010-3W (BOD 1): 21330228
GGA Lot #: 2212690 , pH 10.00 Buffer Lot #: 226066		1	7.2	22	8.2	YSI 4010-3W (BOD 2): 21271718
Seed Lot #: 062205 , Pipette S/N: SH67132		2	7.0	1	7.9	YSI 4010-3W (BOD 3): 22070334
Na2SO3 Lot #: 215429, BOD Buffer Lot #: A2199		3	7.2			
DPD Lot #: A2139 , Purelab Classic Ohms: 18.2		4			8.2	
Incubator ID: 1 , Temp °C min/max: 19.7/20.5		5			8.0	
DO Slope= 1.0 ± 0.06 , pH Slope= 101.1 , % STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0)= 1.00						Reviewed by: PS 5/10/23
						Form # 32, Revision 2.0

CURDATE: 05/03/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

[illegible]

CURDATE: 05/10/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143349

[illegible]

05/17/2023

LAB WORKSHEET

START DATE: 5/17/23
END DATE: 5/22/23

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE:

VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143464

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJODWD	05/16/2023 15:00	AI72396		8.4	19	C		525 50	74 7.4	74 8.1	0.1	270116-01
DOBLKH20	05/16/2023 08:00					A		B	8.0	8.0	0.1	
DOSEEDBK	05/16/2023 08:00					B		SB	8.0	7.2	0.75	
DOSEDCOR	05/16/2023 08:00					C		15 25	7.9	5.2	0.72	
OV_BOD	05/16/2023 08:00			9.2	21	A		8 25 50	74 7.5	5.5	13	
DUPLICATE	05/16/2023 08:00			9.2	21	B		8 25 50	74 7.4	5.1	18	
DO Meter S/N												
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 224681												
pH probe S/N: ARI-16348, pH 7.00 Buffer Lot #: 224683												
GGA Lot #: 2110009 , pH 10.00 Buffer Lot #: 224686												
Seed Lot #: 0162205 , Pipette S/N: SH67132												
Na2SO3 Lot #: 215409 , BOD Buffer Lot #: 224689												
DPD Lot #: 215409 , Purelab Classic Ohms: 19.2												
Incubator ID: 1 , Temp °C min/max: 19.1/20.7												
DO Slope = 1.05/0.00 , pH Slope = 100.7 , STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = 0.72												
Reviewed by: PS 5/22/23												Form # 32, Revision 2.0

CURDATE: 05/23/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

[illegible]

CURDATE: 05/23/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

[illegible]

START DATE: 6/2/23
END DATE: 6/7/23

LAB WORKSHEET

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 06/02/2023

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143718

[illegible]

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

[illegible]

CURDATE: 06/07/2023

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143780

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	RAW DO TEMP.	SAMPLE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	06/06/2023 10:00				A		B B	7.9 7.9	7.7 7.8	0.15	
DOSEEDBK	06/06/2023 10:00				B		SB SB	7.9 7.9	7.3 7.3	0.60	
DOSEDOR	06/06/2023 10:00				C		15 25	7.7 7.7	5.6 4.3	0.50	
OV_BOD	06/06/2023 10:00				B		10 SB 100	8.0 8.2 8.3	6.9 6.5 5.9	6	
DUPPLICATE	06/06/2023 10:00				C		10 SB 100	7.9 8.0 8.2	6.5 6.3 5.8	6	
BODSTD	06/06/2023 10:00				I		6 6 6	7.9 7.9 7.9	3.0 3.9 4.3	174	
PRECISION	06/06/2023 10:00									0	

CURDATE: 06/14/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 143896

[illegible]

CURDATE: 06/21/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

[illegible]

START DATE: 6/28/23
END DATE: 7/3/23

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016
WORKSHEET BATCH NO. 144091

CURDATE: 06/28/2023

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO TEMP, °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.	
DOBLKH20	06/27/2023 11:00	AI80813	1	7.9	22	X	1	8.2	8.0	4.5	1.6	271415-01
DOSEEDBK	06/27/2023 11:00						SB	8.2	7.1	7.4	0.95	
DOSEDCOR	06/27/2023 11:00						15	8.1	6.1	4.9	0.51	
OV BOD	06/27/2023 11:00						25	8.1	7.2	7.0	2	
DUPLICATE	06/27/2023 11:00						25	8.0	6.6	6.7	3	
BODSTD	06/27/2023 11:00						6	8.2	4.2	4.4	170	
pH meter S/N: K16822, pH 4.00 Buffer Lot #: 224881												DO Meter S/N
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 224003												YSI 4010-3W (BOD 1): 21330228
GGA Lot #: 2241009, pH 10.00 Buffer Lot #: 224000												YSI 4010-3W (BOD 2): 21271718
Seed Lot #: 224211, Pipette S/N: SH67132												YSI 4010-3W (BOD 3): 22070334
Na2SO3 Lot #: 215479 BOD Buffer Lot #: A2199												
DPD Lot #: A2327, Purelab Classic Ohms: 18.2												
Incubator ID: 1, Temp °C min/max: 19.7/22.2												Reviewed by: PS 7/3/23
DO Slope= 1.0 ± 0.00, pH Slope= 100.5, % STD = 167.5-228.5, Seed Correction (0.6 - 1.0) = 0.51												Form # 32, Revision 2.0

LAB WORKSHEET

CURDATE: 06/28/2023

START DATE: 06/28/23
END DATE: 07/03/23

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 144091

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.												
PRECISION	06/27/2023 11:00		145	—	—	107.1	—	—	—	—	1												
[REDACTED]																							
pH meter S/N: K16822	pH 4.00 Buffer Lot #:	—	Jug#	pH	7.1 ±0.1	20 ± 3	8.0 ±0.2	—	—	—	DO Meter S/N												
pH probe S/N: BX1-18779	pH 7.00 Buffer Lot #:	—	7.1	—	—	—	—	—	—	—	YSI 4010-3W (BOD 1): 21330228												
GGA Lot #:	pH 10.00 Buffer Lot #:	—	1	—	—	—	—	—	—	—	YSI 4010-3W (BOD 2): 21271718												
Seed Lot #:	Pipette S/N: SH67132	—	2	—	—	—	—	—	—	—	YSI 4010-3W (BOD 3): 22070334												
Na2SO3 Lot #:	BOD Buffer Lot #:	—	3	—	—	—	—	—	—	—													
DPD Lot #:	Purelab Classic Ohms:	—	4	—	—	—	—	—	—	—													
Incubator ID:	Temp °C min/max:	—	5	—	—	—	—	—	—	—													
DO Slope=	pH Slope=	—	% STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) =	0.51																			
										Reviewed by:	PS 7/3/23												
										Form # 32, Revision 2.0													

CURDATE: 07/07/2023

END DATE: 7/12/23

SM 5210 B-2016

WORKSHEET BATCH NO. 144240

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE DO	TEMP. °C	FINAL TIME	SAMPLE VOLUMES, mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SDJWD	07/06/2023 15:00	AI82578		70	21	X	82550	791878	77	77	0.20
DOBLKH20	07/06/2023 10:00										
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 224881											
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 226063											
GGA Lot #: 2211009 , pH 10.00 Buffer Lot #: 226060											
Seed Lot #: 182210 , Pipette S/N: SH67132											
Na2SO3 Lot #: 215429 BOD Buffer Lot #: A2199											
DPD Lot #: A1221 , Purelab Classic Ohms: 18.2											
Incubator ID: 3 , Temp °C min/max: 19.3-20.3											
DO Slope= 1.0±0.06 , pH Slope= 99.0 , % STD = 167.5-228.5, Seed Correction (0.6 - 1.0)=0.77											Reviewed by: PS 7/13/23
Form # 32, Revision 2.0											

CURDATE: 07/07/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOSEEDBK	07/06/2023 10:00		7:49	—	—	3	1145	SB 58	8.0	7.1	0.90	
DOSEDCOR	07/06/2023 10:00			—	—	X		15 28	8.0	5.1	3.5	
OV BOD	07/06/2023 10:00			—	—	Z		10 50 100	7.9	5.5	8	
DUPLICATE	07/06/2023 10:00			—	—	A		10 50 100	8.2	6.1	7	
BODSTD	07/06/2023 10:00			—	—	Y		5 6 6 6	7.9	3.1	170	
PRECISION	07/06/2023 10:00			—	—	—		—	—	—	1	

CURDATE: 07/12/2023
VOLUME OF DILUTION H2O = 191L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	07/11/2023 08:00			—	—	A		B B	8.1 8.0	8.0	0.10	
DOSEDEBK	07/11/2023 08:00			—	—	B		SB SB	8.0 7.3	7.3	0.70	
DOSEDCOR	07/11/2023 08:00			—	—	C		IS 25	8.0 5.4	4.0	0.69	
OV_BOD	07/11/2023 08:00			—	—	A		8 25 50	8.0 8.4 7.6	5.2	15	
DUPLICATE	07/11/2023 08:00			—	—	B		8 25 50	8.0 8.2 7.1	6.1	14	
BODSTD	07/11/2023 08:00			—	—	I		6 6 6 6	8.0 8.0 8.0 8.0	3.6 3.6 3.6 3.6	19.5	
PRECISION	07/11/2023 08:00			—	—	—		—	—	—	1	
pH meter S/N: K16822 , pH 4.00 Buffer Lot #:				Jug#	pH	T°C	D.O.	DO Meter S/N				
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #:				7.1 ±0.1	20 ± 3	8.0 ±0.2		YSI 4010-3W (BOD 1): 21330228				
GGA Lot #:				1	—	—	—	YSI 4010-3W (BOD 2): 21271718				
Seed Lot #:				2	—	—	—	YSI 4010-3W (BOD 3): 22070334				
Na2SO3 Lot #:				3	—	—	—					
DPD Lot #:				4	—	—	—					
Incubator ID:				5	—	—	—					
DO Slope=				% STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) =	0.69			Reviewed by: PS 7/17/23				
pH Slope=								Form # 32, Revision 2.0				

CURDATE: 07/19/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

CURDATE: 07/26/2023
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

CURDATE: 04/17/2024

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 150162

[illegible]

Reviewed by:	PS 4/22/24
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Form # 32, Revision 2.0

CURDATE: 04/24/2024
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	RAW DO TEMP.	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJOWD	04/23/2024 15:00	AJ40831		8.6	7.9	7.9	7.9	26	282323-01
pH meter S/N:	K16822 , pH 4.00 Buffer Lot #:	234703	Jug#	pH	T°C	D.O.	DO Meter S/N		
pH probe S/N:	BX1-18779, pH 7.00 Buffer Lot #:	233930		7.1 ±0.1	20 ± 3	8.0 ±0.2	YSI 4010-3W (BOD 1):	21330228	
GGA Lot #:	2311642, pH 10.00 Buffer Lot #:	233928	1	7.2	23	8.0	YSI 4010-3W (BOD 2):	21271718	
Seed Lot #:	012310 , Pipette S/N:	SH67132	2	↓	↓	7.9	YSI 4010-3W (BOD 3):	22070334	
Na ₂ SO ₃ Lot #:	226198 , BOD Buffer Lot #:	A4019	3	7.1	↓	8.0			
DPD Lot #:	A2280 , Purelab Classic Ohms:	18.2	4	7.2	↓	7.9			
Incubator ID:	I 1 , Temp °C min/max:	20.0/20.4	5	-	-	-			
Reviewed by: ps y/lzq/bv									
Form # 32, Revision 2.0									

CURDATE: 04/24/2024
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START SAMPLE TIME	RAW DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	04/23/2024 08:00	[REDACTED]	700		A	1100	B	8.0	7.8	0.20	[REDACTED]
DOSEEDBK	04/23/2024 08:00	[REDACTED]			B		SB	8.1	7.8	0.90	[REDACTED]
DOSEDOR	04/23/2024 08:00	[REDACTED]			C		15-25	8.1	5.2	0.75	[REDACTED]
OV_BOD	04/23/2024 08:00	[REDACTED]			Z		5-25	8.1	6.4	35	[REDACTED]
DUPPLICATE	04/23/2024 08:00	[REDACTED]			A		5-25	7.9	6.1	51	[REDACTED]
BODSTD	04/23/2024 08:00	[REDACTED]			I		6	8.3	3.7	188	[REDACTED]
PRECISION	04/23/2024 08:00	[REDACTED]			-		6	8.3	3.3	2516	[REDACTED]
[REDACTED SECTION]											
pH meter S/N: K16822 , pH 4.00 Buffer Lot #:				Jug#	pH	T°C	D.O.	DO Meter S/N			
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #:					7.1 ±0.1	20 ± 3	8.0 ±0.2	YSI 4010-3W (BOD 1): 21330228			
GGA Lot #:				1				YSI 4010-3W (BOD 2): 21271718			
Seed Lot #:				2				YSI 4010-3W (BOD 3): 22070334			
Na2SO3 Lot #:				3							
DPD Lot #:				4							
Incubator ID:				5							
DO Slope =											
% STD =											
pH Slope =											
Reviewed by: PS 4/29/24											Form # 32, Revision 2.0

CURDATE: 05/02/2024

SM 5210 B-2016

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 150554

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	STARTS TIME	SAMPLE RAW DO	TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJODWD	05/01/2024 15:00	AJ43844		8.3	22	B		825.50	89.82	764.9	31	287007-01

pH meter S/N: K16822	pH 4.00 Buffer Lot #: 234763	Jug#	pH	T°C	D.O.	DO Meter S/N
pH probe S/N: BX1-18779	pH 7.00 Buffer Lot #: 233930		7.1 ±0.1	20 ± 3	8.0 ±0.2	YSI 4010-3W (BOD 1): 21330228
GGA Lot #: 233316	pH 10.00 Buffer Lot #: 233914	1	7.1	23	7.9	YSI 4010-3W (BOD 2): 21271718
Seed Lot #: 022310	Pipette S/N: SH67132	2	7.1		8.0	YSI 4010-3W (BOD 3): 22070334
Na2SO3 Lot #: 203420	BOD Buffer Lot #: A4019	3	7.1		8.1	
DPD Lot #: A2156	Purelab Classic Ohms: 14.2	4	7.2		8.0	
Incubator ID: 2	Temp °C min/max: 20.0/30.3	5	—	—	—	

Reviewed by: PS 5/8/24	
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Form # 32, Revision 2.0	
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DO Slope= 1.00±0.06, pH Slope= 161.4	
% STD = 167.5-228.5, Seed Correction (0.6 - 1.0)= 0.94	

CURDATE: 05/09/2024

[illegible]

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016
WORKSHEET BATCH NO. 150956

05/15/2024

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START SAMPLE TIME	RAW DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
		AJ47032	05/14/2024 15:00		81	10	A	8.1	8.0	34	289426-01
DOBLKH20	05/14/2024 08:00						B	8.1	8.0	0.10	
DOSEDBK	05/14/2024 08:00						SB	8.1	7.6	10.50	
DOSDCOR	05/14/2024 08:00						IX	8.1	3.2	0.78	
OV_BOD	05/14/2024 08:00						XX	8.1	4.5	17	
DUPLICATE	05/14/2024 08:00						XX	8.1	4.7	16	
BODSTD	05/14/2024 08:00						X	8.2	3.8	178	
PRECISION	05/14/2024 08:00										
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 124703											
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 133330											
GGA Lot #: 13116412 , pH 10.00 Buffer Lot #: 125324											
Seed Lot #: 012310 , Pipette S/N: SH67132											
Na2SO3 Lot #: 103490, BOD Buffer Lot #: A4606											
DPD Lot #: A3306 , Purelab Classic Ohms: 146.2											
Incubator ID: 1 , Temp °C min/max: 19.9/21.6											
DO Slope= 1.00±0.06 , pH Slope= 101.9 % STD = 167.5 - 228.5 Seed Correction (0.6 - 1.0)= 6.7%											
										Reviewed by: PS	5/21/24
Form # 32, Revision 2.0											

START DATE: 5-23-24
END DATE: 5-28-24

LAB WORKSHEET

05/23/2024

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L

SM 5210 B-2016

VOLUME OF DILUTION $H_2O = 19L$

VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 151217

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJODWD	05/21/2024 15:00	AJ48354		7.3	23	3		5 25 58	8.2	5.4	15	289430-01
DO Slope= 1.00±0.06, pH Slope= 102.4, % STD = 167.5-228.5, Seed Correction (0.6-1.0)= 0.77 DO Slope= 1.00±0.06, pH Slope= 102.4, % STD = 167.5-228.5, Seed Correction (0.6-1.0)= 0.77												

START DATE: 5/29/24
END DATE: 6/3/24

LAB WORKSHEET

BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

WORKSHEET BATCH NO. 151342

05/29/2024

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

[illegible]

START DATE: 6/5/24
END DATE: 6/10/24

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 06/05/2024

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 151520

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START SAMPLE TIME	SAMPLE DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJODWD	06/04/2024 15:00	AJ51038		9.3	22 B		X 25 50	8.2 8.2	67 4.5 1.2	35 PS	289438-01
DOBLKH20	06/04/2024 08:00			—	2		B 3	8.2 8.2	8.0 8.0	0.70	
DOSEDBK	06/04/2024 08:00			—	3		SB SB	8.2 8.2	7.4 7.3	0.25	
DOSEDCOR	06/04/2024 08:00			—	X		X 25	8.2 8.2	5.0 2.8	0.86	
OV_BOD	06/04/2024 08:00			—	X		X 25 50	8.1 8.1	5.7 3.6	20	
DUPLICATE	06/04/2024 08:00		4	—	Y		X 25 50	8.1 8.1	5.3 3.7	22	
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 234703											
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 23930											
GGA Lot #: 231642 , pH 10.00 Buffer Lot #: 235224											
Seed Lot #: 022310 , Pipette S/N: SH67132											
Na2SO3 Lot #: 203490 , BOD Buffer Lot #: A4020											
DPD Lot #: A3308 , Purelab Classic Ohms: 18.2											
Incubator ID: 1 , Temp °C min/max: 20.0/20.9											
DO Slope= 1.00± 0.06 , pH Slope= 102.0 % , STD = 167.5- 228.5, Seed Correction (0.6 - 1.0)= 0.86											
										Reviewed by:	PS 6/11/24
Form # 32, Revision 2.0											

CURDATE: 06/12/2024
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

06/11/2024	15:00	AJ51871	8.3	19	A	25	50	22	22	22	64	3.4	2.4	39 P	289440-01
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	Jug#	pH	T°C	D.O.	DO Meter S/N
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 234703					
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 233930		7.1 ±0.1	20 ± 3	8.0 ±0.2	YSI 4010-3W (BOD 1): 21330228
GGA Lot #: 23116442 , pH 10.00 Buffer Lot #: 235224	1	7.0	22	8.2	YSI 4010-3W (BOD 2): 21271718
Seed Lot #: 022310 , Pipette S/N: SH67132	2	7.2		8.1	YSI 4010-3W (BOD 3): 22070334
Na2SO3 Lot #: 203490 , BOD Buffer Lot #: A4020	3	7.2		8.1	
DPD Lot #: A3308 , Purelab Classic Ohms: 18.2	4	7.1		8.0	
Incubator ID: 1 , Temp °C min/max: 19.6/20.6	5	7.0		8.0	
DO Slope= 1.00 ± 0.06 , pH Slope= 10.10 , % STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = 0.63					Reviewed by: PS 6/18/24
					Form # 32, Revision 2.0

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016
WORKSHEET BATCH NO. 151711

CURDATE: 06/12/2024

VOLUME OF DILUTION $H_2O = 19L$
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 151711

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	06/11/2024 08:00	[REDACTED]		—	—	A		B B	8.2 8.2	8.0 8.1	0.15	
DOSEEDBK	06/11/2024 08:00	[REDACTED]		—	—	B		SB SB	8.3 8.2	7.2 7.3	1.00	
DOSEDCOR	06/11/2024 08:00	[REDACTED]		—	—	C		15 25	8.3 8.3	5.2 2.5	0.83	
OV BOD	06/11/2024 08:00	[REDACTED]		—	—	A		SB 25 50	8.2 8.2 8.3	6.2 4.4 3.7	24	
DUPLICATE	06/11/2024 08:00	[REDACTED]		—	—	B		SB 25 50	8.2 8.2 8.3	6.5 5.3 3.8	23	
BODSTD	06/11/2024 08:00	[REDACTED]		—	—	1		6 6 4 6	8.2 8.2 8.2	3.4 3.5 3.6	195	
PRECISION	06/11/2024 08:00	[REDACTED]		—	—	—					1	
DO Meter S/N												
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 234703						Jug#	pH	T°C	D.O.			
pH probe S/N: BXL-18779, pH 7.00 Buffer Lot #: 233936							7.1 ±0.1	20 ± 3	8.0 ±0.2			
GGA Lot #: 2311647 , pH 10.00 Buffer Lot #: 235224						1	7.0	22	8.2			
Seed Lot #: 022316 , Pipette S/N: SH67132						2	7.2		8.1			
Na2SO3 Lot #: 203490 , BOD Buffer Lot #: 144020						3	7.2		8.1			
DPD Lot #: 13308 , Purelab Classic Ohms: 18.2						4	7.1		8.0			
Incubator ID: 1 , Temp °C min/max: 19.6/20.6						5	7.1		8.0			
DO Slope = 1.00 ± 0.06 , pH Slope = 101.8 , % STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) = 0.83							7.0		8.2			
										Reviewed by: PS 6/18/24		
										Form # 32, Revision 2.0		

START DATE: 6/19/24
END DATE: 6/24/24

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 06/19/2024

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 151942

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
	06/18/2024 15:00	AJ53367		6.6	19	Y		25 50	80 8.1	4.2 1.3	36 PS	289450-01
pH meter S/N: K16822, pH 4.00 Buffer Lot #: 234703 pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 239930 GGA Lot #: 2311642, pH 10.00 Buffer Lot #: 235224 Seed Lot #: 022310, Pipette S/N: SH67132 Na2SO3 Lot #: 203490, BOD Buffer Lot #: 04020 DPD Lot #: A4053, Purelab Classic Ohms: 10.1 Incubator ID: 1, Temp °C min/max: 19.6/20.2												
DO Slope = 1.00 ± 0.06 , pH Slope = 10.1.3 % STD = 167.5-228.5, Seed Correction (0.6 - 1.0) = 0.78 DO Slope = 1.00 ± 0.06, pH Slope = 10.1.3 % STD = 167.5-228.5, Seed Correction (0.6 - 1.0) = 0.78												

CURDATE: 06/19/2024

VOLUME OF DILUTION H₂O = 19 L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 151942

[illegible]

START DATE: 6/27/24
END DATE: 7/2/24

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 06/27/2024

VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 152175

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	RAW DO	SAMPLE DO TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJODWD	06/26/2024 15:00	AJ54903		60	21	23		5 25 50	7.9 7.9 7.9	6.2 3.9 2.1	38	289453-01
DOBLKH20	06/26/2024 10:00					A		13 13	7.9 7.9	7.7 7.8	0.15	
DOSEEDBK	06/26/2024 10:00					B		53 53	7.9 7.9	7.0 7.0	0.90	
DOSEDCOR	06/26/2024 10:00					C		18 25	7.9 8.0	4.8 3.0	0.80	
OV BOD	06/26/2024 10:00					1		10 50 100	7.9 8.0 8.1	6.5 5.6 4.7	9	
DO Meter S/N												
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 234703												
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 233930												
GGA Lot #: 2401K44 , pH 10.00 Buffer Lot #: 235224												
Seed Lot #: 022310 , Pipette S/N: SH67132												
Na2SO3 Lot #: 203440 , BOD Buffer Lot #: A4020												
DPD Lot #: A4053 , Purelab Classic Ohms: 10.2												
Incubator ID: 2 , Temp °C min/max: 20.0/20.6												
DO Slope= 1.00 ± 0.06 , pH Slope= 101.8 , % STD = 167.5-228.5, Seed Correction (0.6 - 1.0)= 0.80												
Reviewed by: PS 7/2/24												Form # 32, Revision 2.0

CURDATE: 06/27/2024

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 152175

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DUPLICATE	06/26/2024 10:00		7:45	—	2	1000	50 100	7.9 8.0	6.3 5.5	9	
BODSTD	06/26/2024 10:00		↓	—	1		6 6 6	8.0 8.0 7.9	3.7 3.6 3.8	175	
PRECISION	06/26/2024 10:00		△	—	—		—	—	—	0	
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CURDATE: 07/03/2024
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
SJODWD	07/02/2024 15:00	AJ56740		8.3	19	Y		8 25 56	8.0 8.1	3.9 8.7	400	289457-01
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 234703	Jug#	pH	T°C	D.O.								
pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 233930		7.1 ±0.1	20 ± 3	8.0 ±0.2								
GGA Lot #: 2401K44 , pH 10.00 Buffer Lot #: 233928	1	7.1	23	8.0								
Seed Lot #: 022310 , Pipette S/N: SH67132	2	7.0										
Na2SO3 Lot #: 203490 , BOD Buffer Lot #: A4020	3	7.1										
DPD Lot #: A4053 , Purelab Classic Ohms: 18.2	4	7.0										
Incubator ID: 1 , Temp °C min/max: 19.6/20.1	5	7.0										
DO Slope = 1.00 ± 0.06, pH Slope = (0).0 % STD = 167.5 - 228.5, Seed Correction (0.6 - 1.0) =												
											Reviewed by:	(S) 1/10/24
											Form # 32, Revision 2.0	

START DATE: 7/24/24
END DATE: 7/29/24

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016
WORKSHEET BATCH NO. 152877

CURDATE: 07/24/2024
VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

LOCCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL MAX=200mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
	07/23/2024 15:00	AJ60648	✓	8.1	18	X	✓	8 25 50	8.1	4.3	36.8	289465-01
pH meter S/N: K16822 , pH 4.00 Buffer Lot #: 233052 DO Meter S/N pH probe S/N: BX1-18779, pH 7.00 Buffer Lot #: 241007 YSI 4010-3W (BOD 1): 21330228 GGA Lot #: 230K78 , pH 10.00 Buffer Lot #: 233928 1 YSI 4010-3W (BOD 2): 21271718 Seed Lot #: 0222310, Pipette S/N: SH67132 2 YSI 4010-3W (BOD 3): 22070334 Na2SO3 Lot #: 203450 , BOD Buffer Lot #: A4021 3 DPD Lot #: A4053 , Purelab Classic Ohms: 18.2 4 Incubator ID: 1 , Temp °C min/max: 19.9/20.2 5												
											Reviewed by:	PS 7/29/24
DO Slope= 1.00 ± 0.06, pH Slope= 100.5 % , STD = 167.5- 228.5, Seed Correction (0.6 - 1.0)= 0.82											Form # 32, Revision 2.0	

START DATE: 7/24/24
END DATE: 7/29/24

LAB WORKSHEET
BIOCHEMICAL OXYGEN DEMAND(5-DAY) - MDL=1.5 mg/L
SM 5210 B-2016

CURDATE: 07/24/2024

VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 152877

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	SAMPLE RAW DO	SAMPLE TEMP. °C	SAMPLE PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	07/22/2024 10:00					A		B B	8.2 8.2	8.0 8.0	0.20	
DOSEDBK	07/22/2024 10:00					b		SB SB	8.2 8.2	7.2 7.2	1.00	
DOSEDCOR	07/22/2024 10:00					C		18 25 50 100	8.2 8.2	5.1 3.1	0.82	
OV BOD	07/22/2024 10:00					C		10 50 100	8.2 8.3 8.3	6.4 5.4 3.8	12	
DUPLICATE	07/22/2024 10:00					I		10 50 100	8.3 8.3 8.4	6.4 5.4 3.8	12	
BODSTD	07/22/2024 10:00					I		6 6 6 6	8.2 8.2 8.2 8.2	3.6 3.6 3.6 3.6	191	
PRECISION	07/22/2024 10:00										0	

LAB WORKSHEET

CURDATE: 07/31/2024

START DATE: 7/31/24
END DATE: 8/5/24

BIOCHEMICAL OXYGEN DEMAND(5-DAV) - MDL=1.5 mg/L
SM 5210 B-2016

VOLUME OF DILUTION H2O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 153039

LOCODE	COLLECTION DATE	SAMPLE ID NUMBER	START TIME	RAW DO	SAMPLE TEMP. °C	PROBE ID	FINAL TIME	SAMPLE VOLUMES, mL	INITIAL D.O., mg/L	FINAL D.O., mg/L	RESULTS (mg/L)	CHAIN OF CUSTODY No.
DOBLKH20	07/30/2024 15:00	AJ62089										289463-01
DOSEEDBK	07/30/2024 10:00											
DOSEDCOR	07/30/2024 10:00											
pH meter S/N: K16822	pH 4.00 Buffer Lot #: 233032											
pH probe S/N: BX1-18779	pH 7.00 Buffer Lot #: 241007											
GGA Lot #: 2401K44	pH 10.00 Buffer Lot #: 233926											
Seed Lot #: 4122H 002310	Pipette S/N: SH67132											
Na2SO3 Lot #: 44203420	BOD Buffer Lot #: A4021											
DPD Lot #: A4053	Purelab Classic Ohms: 18.2											
Incubator ID: 1	Temp °C min/max: 19.7/20.3											
DO Slope= 1.00 ± 0.06	pH Slope= 96.1											
% STD = 167.5-228.5, Seed Correction (0.6 - 1.0) = 0.83 DO Slope = 1.00 ± 0.06, pH Slope = 96.1												Reviewed by: PS 8/6/24 Form # 32, Revision 2.0

CURDATE: 07/31/2024
VOLUME OF DILUTION H₂O = 19
VOLUME OF SEED = 4 mL

VOLUME OF DILUTION H₂O = 19L
VOLUME OF SEED = 4 mL

WORKSHEET BATCH NO. 153039

[illegible]