SOAH DOCKET NO. 582-22-0585

ED-18
Modeling Review Checklist

DISSOLVED OXYGEN MODELING
PERMIT REVIEW CHECKLIST
TCEQ WATER QUALITY ASSESSMENT TEAM
WATER QUALITY ASSESSMENT SECTION
WATER QUALITY DIVISION

Owner:	City of Granbury
TPDES Permit Number:	WQ0015821001
Permit Action:	☐ Renewal ☒ New ☐ New/Replace Expired ☐ Amendment
Other Review:	☐ Preliminary Review ☐ SRF Review
County:	Hood
Segment Number:	1205
Received Date:	01/17/2020
Completion Date:	01/24/2020
Discharge Route:	

Unnamed tributary (0.4 km) -> Rucker Creek (0.6 km) -> Segment 1205 (Lake Granbury)

1. **Previous analysis**: ☒ No ☐ Yes Date:

2. **Segment 303(d)-listed**: ☒ No ☐ Yes List Date: ☐
   Dissolved Oxygen Impairment? ☐ No ☐ Yes (*Note: Do not model waters with DO listing; check exact location of AU)*

3. **Approved TMDL:** ☒ No ☐ Yes ☐ Include language in memo if for DO

4. **Waste Load Evaluation (WLE)**: ☒ No ☐ Yes

5. **Tidal:**
   Is initial receiving water tidal? ☒ No ☐ Yes Is the Segment tidal? ☒ No ☐ Yes

6. **Discharge Directly to a Lake**: ☒ No ☐ Yes

7. **Watershed Protection rules apply:** ☐ No ☒ Yes ☐ N/A
   ☐ 30 TAC CHAPTER 311 Watershed Protection rules *(Lake Travis [1404, 1414]; Austin [1403]; Inks [1407]; Buchanan [1408, 1409, 1410, 1416, 1417, 1418, 1420, 1431, 1432]; Clear Lake [2425, 1101, 1102, 1113] 5/12/2; Lake Houston Watershed [1002, 1003, 1004, 1008, 1009, 1010, 1011, 1015] 10/3/4; Colorado River [1428 main stem] 10/15/2/5, [1427, Onion Creek, and tributaries and 1428 tributaries] 5/5/2/1; LBJ [1406, 1415]; Marble Falls [1405]; Worth [0807, 0808]; Eagle Mountain [0809]; Bridgeport [0811]; Cedar Creek [0818]; Arlington [0828]; Benbrook [0830, 0831]; Richland-Chambers [0836] Worth-Richland 10/15/--/4, 30/90 for ponds; John Graves quarries [1206])*
   ☒ 30 TAC §§309.3(c) within 5 miles upstream of lake or reservoir that may be used as source for public drinking water supply 10/15/--/4 or 30/90/--/4 for pond plants *(domestic wastewater only, including domestic component of industrial wastewater)*

8. **Edwards Aquifer Rules apply:** ☒ No ☐ Yes
   Within or near: ☐ Recharge Zone ☐ Contributing Zone ☐ Transition Zone

9. **DO criteria from Standards Implementation Team Worksheet**:

Unnamed tributary 3.0 mg/L
Rucker Creek 5.0 mg/L
Segment 1205 5.0 mg/L

10. **Existing effluent limits**: NA

11. **Effluent analysis:** NA

12. **Proposed wastewater flow and quality**:

Phase:	Interim I	Interim II	Final
Q	= 1.0 MGD	NA	= 2.0 MGD
BOD_5	= 5.0 mg/L	NA	= 5.0 mg/L
TSS	= 12 mg/L	NA	= 12 mg/L
NH_3-N	= 2.0 mg/L	NA	= 3.0 mg/L
DO	= 4.0 mg/L	NA	= 4.0 mg/L

13. **Basis for analysis**:
☐ QUAL-TX model DOS BOX
☒ QUAL-TX for Windows model
☐ QUAL-TX model from WLE
☐ CSTR model
☐ LA-QUAL model
☐ WASP model
☐ QUAL2K model
☐ Best Professional Judgment (BPJ)
☐ None

14. **Effluent flow path and distances for modeling**:

Effluent flows 0.4 km in unnamed tributary into Rucker Creek then travels downstream 0.60 km before entering into a backwater section of an inlet in Lake Granbury (1205).

15. **Other dischargers** to consider:
None

16. **Headwater flow** (≥ 7Q2): Table 4 applies? ☐ Yes (Freshwater streams, Apr – Oct only) ☒ No

Headwater flow of Rucker Creek modeled as 0.1 cfs. Unnamed tributary 0.0 cfs.

17. **Hydraulics**:

☒ No information provided in the application, used default values:
a = 0.131 b = 0.500 c = 0.720 d = 0.400
Modeled with default hydraulics for advective reaches (unnamed tributary and Rucker Creek).
The proposed outfall location is located downstream of a perennial pooled portion of the unnamed tributary, per aerial imagery.

Hydraulics for backwater and cove reaches of lake inlet included in the model were derived from width and depth measurements gathered from GoogleEarth, USGS topography, and BPJ. Average widths were calculated from reach surface areas divided by reach lengths. A table describing each modeled reach in Lake Granbury and their corresponding hydraulic information is shown below:

Name	Length (m)	Surface Area (m^2)	Calculated Average Width (m)	Estimated Average Depth (m)
Lake Granbury (Backwater #1)	200	3255	16.28	0.5
Lake Granbury (Backwater #2)	300	7392	24.64	0.5
Lake Granbury (Backwater #3)	250	10472	41.89	1.0
Lake Granbury (Backwater #4)	330	18889	57.24	1.5
Lake Granbury (Cove #1)	250	40464	161.86	2.5
Lake Granbury (Cove #2)	210	40327	192.03	2.5
Lake Granbury (Cove #3)	210	39789	189.47	3.5

18. **Modeling Results**:

DO Criteria (mg/L):		3.0 mg/L Unnamed Tributary	5.0 mg/L Rucker Creek	5.0 mg/L Lake Granbury
Flow	Effluent Set	Min. DO (mg/L)	Min. DO (mg/L)	Min. DO (mg/L)
1.0 MGD	5/1.6/6	5.49 OK	5.27 OK	4.84 OK
2.0 MGD	5/1.0/6	5.74 OK	5.56 OK	4.81 OK

Note: Up to 0.2 mg/L below the DO criterion is considered consistent

19. **Recommended limits**:

Phase:	Interim I	Interim II	Final
At Q	= 1.0 MGD	= NA MGD	= 2.0 MGD
$CBOD_5$	= 5.0 mg/L	= NA mg/L	= 5.0 mg/L
NH_3-N	= 1.6 mg/L	= NA mg/L	= 1.0 mg/L
DO	= 6.0 mg/L	= NA mg/L	= 6.0 mg/L

20. **WQMP status**: ☐ Consistent With ☒ Update required ☐ N/A

21. **Files saved as**:
F/...1205/15821001_Loading.INP
F/...1205/15821001_NoLoad.INP

22. **Documentation**:
☒ Modeling file with memo (*include standards worksheet*)
WQMP Coordinator: (any permit that requires modification of WLAs in WQMP or TMDL database; include flow information for all outfalls and all phases)
☐ *Municipals: for WQMP new and amend, name change, add monitoring req, segment change*)
☐ Municipals: *TMDL completed for any constituent, renewal with change in name (paper copy only) new or amend permits (paper and electronic copies)*
☐ Industrials: *TMDL completed for any constituent, renewal with change in flow or name (paper copy only;) new or amend permits (paper and electronic copies)*

☒ **WQMP packet**: *some municipal permits; provide electronic copy (memo and model input) and hard copy (memo, worksheet, map); not for more stringent effluent limits or <0.2 MGD with uncalibrated (default) QUAL-TX model; see memowqmp.doc for memo language*)

TMDL team

- ☐ *TMDL underway for DO only, new or amend permits; email memo*)
- ☐ *TMDL completed for any constituent, new or amend permits; email memo*)

☒ **Copy memo** to I:\Permrev\WWTP\Section Permit Memos\Modeling

Notify Team Leader if:

- ☒ <5/2/6 limits for municipal
- ☒ NH_3-N limit < 2 mg/L
- ☐ No effluent limits can be recommended
- ☐ Recommend addition of DO monitoring for an industrial permit

☒ **Update the Water Quality Application Tracking Database** with modeling review assigned date, memo date, modeling review end date, modeling review comments if any, reviewer begin date for the next reviewer and peer review assigned date if any. Enter a new record for Supersedes memo.

☐ **Update the WQMP** tab in the Water Quality Application Tracking Database (*municipal renewals only or amend with no changes in loadings; also for new replacing expired if consistent with expired permit – include note to that effect*)

☒ Permit file with memo to biomonitoring reviewer or municipal/industrial permits team leader as appropriate (*sign/date blue sheet*)

23. **Permit Review by**:

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James E. Michalk Date