

Texas Institute for Applied Environmental Research: Assessment of Water Quality and Watershed Based Planning for Nolan Creek/South Nolan Creek (58-13-30061)
Progress Report: FY 2014 Quarter 3 covering March 1, 2014 – May 31, 2014 (submitted June 11, 2014)

| TASK | DELIVERABLE | DUE DATE | DATE SUBMITTED |
|---|---|--|---|
| Contract Executed September 18, 2012 | | | |
| 1.2 | Quarterly Progress Report FY13 Q-1 No. 1 Quarterly Progress Report FY13 Q-2 No. 2 Quarterly Progress Report FY13 Q-3 No. 3 Quarterly Progress Report FY13 Q-4 No. 4 Quarterly Progress Report FY14 Q-1 No. 5 Quarterly Progress Report FY14 Q-2 No. 6 Quarterly Progress Report FY14 Q-3 No. 7 Quarterly Progress Report FY14 Q-4 No. 8 Quarterly Progress Report FY15 Q-1 No. 9 Quarterly Progress Report FY15 Q-2 No. 10 Quarterly Progress Report FY15 Q-3 No. 11 Quarterly Progress Report FY15 Q-3 No. 12 | Dec. 15, 2012 Mar. 15, 2013 Jun. 15, 2013 Sep. 15, 2013 Dec. 15, 2013 Mar. 15, 2014 Jun. 15, 2014 Sep. 15, 2014 Dec. 15, 2014 Mar. 15, 2015 Jun. 15, 2015 Sep. 15, 2015 | December 14, 2012 March 15, 2013 June 14, 2013 Sept. 13, 2013 Dec. 13, 2013 March 18, 2014 |
| 1.3 | Contract Communication Post-Award Meeting Post Award Meeting Minutes Quarterly Communication Minutes | Oct., 18, 2012 Dec. 15, 2012 Quarterly with QPR | Held Sep. 21, 2012 at TCEQ Offices in Austin Informal project meeting held April 24 between Anne McFarland from TIAER & Kristina Ramirez from City of Killeen in conjunction with Brazos Basin Steering Committee meeting. No formal minutes were kept. TIAER personnel met at TCEQ offices in Austin on May 28 primarily to discuss change in TIAER personnel. Minutes in Attachment #1. |
| 1.4 | Annual Report Article FY13 Annual Report Article FY14 Annual Report Article FY15 | Upon Request Upon Request Upon Request | |
| 1.5 | Project Coordination Meeting with EPA | Sep 30, 2014 | |

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|-------------|--|---|---|
| 2.1 | QAPP Planning Meeting with City of Killeen | Oct. 18, 2012 | Feb. 11, 2013 TIAER met with CoK in Killeen to discuss the QAPP and Monitoring plan drafts. |
| 2.2 | Draft QAPP for Monitoring | Nov. 16, 2013 | Feb. 22, 2013 - A draft Monitoring QAPP was sent to the TCEQ Project Manager for review. Received comments March 28 and responded with final revision dated April 17, 2013 and QAPP approved May 2, 2013 |
| 2.3 | Draft QAPP for Modeling | Nov. 16, 2013 | Feb. 22, 2013 – A draft Modeling QAPP was sent to the TCEQ Project Manager for review. Received comment April 4 and responded with final revision dated May 13, 2013 approved May 16, 2013. |
| 2.4 | QAPP Updates FY13 FY14 | No less that 60 days prior to end of effective period | Annual certification letter submitted to TCEQ on Feb. 5, 2014 noting only organization changes to the Modeling QAPP. Annual revision submitted on Jan. 28, 2013 to TCEQ and approved on Mar. 8, 2014 for the Monitoring QAPP. Annual certification letter for monitoring QAPP sent Feb. 28, 2014. |
| 2.5 | QAPP Amendments Draft QAPP Amendments Final | As needed As needed | No activity this quarter |
| 2.6 | Data Submittals (quarterly data submittals requested by TCEQ PM) | Mar. 15, 2013 Jun. 15, 2013 Sep. 15, 2013 Dec. 15, 2013 Mar. 15, 2014 Jun. 15, 2014 Sep. 15, 2014 Dec. 15, 2014 Mar. 15, 2015 Jun. 15, 2015 Aug. 15, 2015 | Data collection started in May 2013 with approval of monitoring QAPP. First data submittal sent Sep. 13, 2013. Second submittal sent Dec. 16, 2013 Third submittal sent Mar. 12, 2014 |

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|-------------|--|--------------------------------|--|
| 3.1 | Draft PPP | Dec. 15, 2012 | Feb. 25, 2013 – Submitted to TCEQ PM Mar. 4, 2013 – PPP approved by TCEQ PM. |
| | Final PPP | Mar. 15, 2013 | Mar. 5, 2013 – Distributed final PPP in PDF form to project partners and TCEQ PM |
| 3.2 – 3.5 | Stakeholder Group Development, Activities, Meetings and Project Dissemination | Quarterly | Last public stakeholder meeting held January 16, 2014. |
| 3.6 | Draft Building Partnerships – Element E, Part A Report | Mar. 15 & Sep. 15, 2013 & 2014 | March 4, 2013 – TCEQ PM gave final approval of PPP and approved document was sent in PDF form to project partners. |
| | Final Building Partnerships – Element E, Part A Report | Aug. 15, 2015 | |
| 4.1-4.2 | Inventory of existing data and GIS representation for watershed in shapefile or ArcGIS grid format | Nov. 15, 2013 | Delayed but in progress |
| 4.3 | Draft Watershed Characterization Report | Dec. 15, 2013 | Delayed but in progress. TCEQ PM notified of need for extension of due date. |
| | Final Watershed Characterization Report | March 15, 2014 | |
| 5.2 | Draft Water Quality Monitoring Plan | Nov. 16, 2012 | Reconnaissance and planning meeting held between TIAER and CoK January 18, 2013 |
| | Final Water Quality Monitoring Plan | Dec. 15, 2012 | Submitted to TCEQ PM for review February 22, 2013 and approved March 8, 2013. |
| 5.3 | Source Survey Technical Report | Dec. 15, 2014 | |
| 5.5 | Draft Watershed Characterization – Phase 2 Report | Apr. 15, 2015 | |
| | Final Watershed Characterization – Phase 2 Report | Jun. 15, 2015 | |
| 6.2 | Watershed maps that identify potential cause and sources of water quality problems | Jun. 15, 2015 | |
| 6.5 | Draft Watershed Characterization Phase 3 Report with Loadings | June 15, 2015 | |
| | Final Watershed Characterization Phase 3 Report with Loadings | Jul. 15, 2015 | |
| 7.1 | Define Education Goals | Mar. 15, 2013 | Strategies for reaching targeted audience outlined in PPP |
| 7.2 | Identify Target Audience | Mar. 15, 2013 | Target audience identified in PPP |

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|-------------|--|---|---|
| 7.3 | Design Implementation Measures | Mar. 15, 2013 | |
| 7.4 | Evaluate Education and Outreach Program FY13 FY14 FY15 | Sep. 15, 2013 Sep. 15, 2014 Sep. 15, 2015 | Educational trifold flier developed and approved by TCEQ PM (see Attachment #2). Work continuing on pre- and post-evaluation tool. |
| 7.5 | Draft Information & Education Plan Report Final Information & Education Plan Report | Jun. 15, 2015 Jul. 15, 2015 | |
| 8.1- 8.2 | Draft Project Report Final Project Report | Jul. 15, 2015 Aug. 15, 2015 | |

GENERAL COMMENTS

| TASK | COMMENTS/ACTIVITIES |
|---|---|
| 1. Project Administration | Project administrative duties occurred as needed including frequent email communication, development of quarterly progress reports and reimbursement requests. |
| 2. Quality Assurance | No activity this quarter. Annual revisions conducted and approved last quarter. |
| 3. Building Partnerships | TIAER staff presented an overview of the Nolan Creek project at the Brazos River Basin Steering committee meeting held April 24, 2014. Also attended Brazos Basin Coordinated monitoring meeting on May 1. |
| 4. Watershed Characterization – Data Inventory | Work continued throughout the quarter with regard to the data inventory. The CoK is reviewing the data prior to making it available to TIAER for other tasks. |
| 5. Watershed Characterization – Data Collection and Analysis | Routine monitoring was conducted monthly throughout the quarter at all 11 stations and is summarized in Table 1 at the end of the General Comments Section. Storm monitoring was conducted in late March at the four storm sampling stations (see Table 2). Corrective Action Reports and Corrective Action Plans issued for project samples are presented in Table 3 with the Corrective Action Status as Table 4. |
| 6. Identification of Causes and Sources of Pollution and Estimation of Pollutant Loads | Limited activity this quarter with efforts focused on review of historical data for future use in source identification models. |
| 7. Information and Education Component | Trifold educational flier developed and approved. Work continued on a pre and post assessment/knowledge tool. |
| 8. Project Report | No activity to report |

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Table 1. Routine Monthly Monitoring for March 2014 through May 2014. Number of samples and comments, as applicable.

| Collection Date | TCEQ Station ID | Sonde | Nutrients & TSS | <i>E. coli</i> | Flow | Comments |
|-----------------|-----------------|-------|-----------------|----------------|------|---|
| 19Mar2014 | 11915 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 18828 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 21436 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 18827 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 21437 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 11913 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 11911 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 11910 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 11908 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 11905 | 1 | 1 | 1 | 1 | |
| 19Mar2014 | 14237 | 1 | 1 | 1 | 1 | |
| 09Apr2014 | 11915 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 18828 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 21436 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 18827 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 21437 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 11913 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 11911 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 11910 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 11908 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 11905 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 09Apr2014 | 14237 | 1 | 1 | 1 | 1 | No data for specific conductance (see CAR 14-0031 in Table 3) |
| 07May2014 | 11915 | 1 | 1 | 1 | 1 | |
| 07May2014 | 18828 | 1 | 1 | 1 | 1 | |

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| Collection Date | TCEQ Station ID | Sonde | Nutrients & TSS | <i>E. coli</i> | Flow | Comments |
|-----------------|-----------------|-------|-----------------|----------------|------|----------|
| 07May2014 | 21436 | 1 | 1 | 1 | 1 | |
| 07May2014 | 18827 | 1 | 1 | 1 | 1 | |
| 07May2014 | 21437 | 1 | 1 | 1 | 1 | |
| 07May2014 | 11913 | 1 | 1 | 1 | 1 | |
| 07May2014 | 11911 | 1 | 1 | 1 | 1 | |
| 07May2014 | 11910 | 1 | 1 | 1 | 1 | |
| 07May2014 | 11908 | 1 | 1 | 1 | 1 | |
| 07May2014 | 11905 | 1 | 1 | 1 | 1 | |
| 07May2014 | 14237 | 1 | 1 | 1 | 1 | |

Sonde data includes dissolved oxygen, specific conductance, pH, and water temperature.

Nutrients include nitrite-nitrogen + nitrate-nitrogen (NO₂-N+NO₃-N, dissolved), total Kjeldahl nitrogen (TKN), orthophosphate-phosphorus (OPO₄-P, dissolved), and total phosphorus (TP).

Table 2. Storm Monitoring for March through May 2014. Number of samples and comments, as applicable. Nutrient and TSS, unless noted, represent a flow-weighted sample collected with an automated sampler. Samples for *E. coli* are grab samples collected during elevated flow conditions.

| Collection Date | TCEQ Station ID | Nutrients & TSS | <i>E. coli</i> | Flow | Comments |
|-----------------|-----------------|-----------------|----------------|------|----------|
| 29Mar2014 | 18828 | 1 | 1 | 1 | |
| 29Mar2014 | 11913 | 1 | 1 | 1 | |
| 29Mar2014 | 11910 | 1 | 1 | 1 | |
| 29Mar2014 | 11905 | 1 | 1 | 1 | |

Nutrients include nitrite-nitrogen + nitrate-nitrogen (NO₂-N+NO₃-N, dissolved), total Kjeldahl nitrogen (TKN), orthophosphate-phosphorus (OPO₄-P, dissolved), and total phosphorus (TP).

Corrective Action Reports

The below listing includes CARs where data quality was potentially impacted and required notification and review by the TIAER PM. The deficiencies were not such to require immediate reporting to TCEQ, and are, thus, reported with the QPR.

Table 3
Summary of new Corrective Action Reports

| TIAER CAR # & CAP# | Sample Collection Date | Report Initiation Date | TIAER Sample Number(s) | Site(s) | Description of Deficiency | Cause(s) | Resulting or Suggested Action | Corrective Action for Specific Incident | Corrective Actions to be Taken | Proposed Completion Date | Date Closed |
|--------------------|------------------------|------------------------|----------------------------|-----------|--|--|---|--|---|--------------------------|----------------|
| 14-0022 & CAP #5 | 19Mar2014 | 19Mar2014 | 1000093343 | 14237 | MS recovery for PO ₄ -P 172%, upper limit 125%. Sample value 1.55 mg/L, spike recovery 2.41 mg/L and spike level 0.5 mg/L. | Uncertain, complex matrix and high value relative to level of spike. | None | None | Flag data with "SR" for spike recovery outside accepted limits | 13Jun2014 | Not yet closed |
| 14-0031 & CAP #6 | 09Apr2014 | 21Apr2014 | 1000093417 thru 1000093428 | All sites | Incorrect calibration of specific conductance | Barometric pressure mistakenly entered into conductivity section of calibration step | Erroneous readings for specific conductance | Data to be noted in submittal as lacking readings for specific conductance | Technician to review calibration procedures prior to calibrating next set of sondes | 21Apr2014 | 27May2014 |
| 14-0035 & CAP #5 | 09Apr2014 | 01May2014 | 1000093425 | 18827 | MS recovery for NO ₂ -N+NO ₃ -N 172%, upper limit 162%. Sample value 12.8 mg/L, spike recovery 14.4 mg/L and spike level 1 mg/L. | Uncertain, complex matrix and high value relative to level of spike. | None | None | Flag data with "SR" for spike recovery outside accepted limits | 13Jun2014 | Not yet closed |
| 14-0038 & CAP #5 | 07May2014 | 20May2014 | 1000093474 | 14237 | MS recovery for TKN 127%, upper limit 125%. Sample value 1.53 mg/L, spike recovery 6.60 mg/L and spike level 4 mg/L. | Uncertain, complex matrix. | None | None | Flag data with "SR" for spike recovery outside accepted limits | 13Jun2014 | Not yet closed |

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**Table 4
Corrective Action Status Table**

| Corrective Action # (CARs) | Date Issued (CAP) | Description of Deficiency | Action Taken | Date Closed |
|-------------------------------------|--------------------------|---|--|--------------------|
| 1 (CARs 13-0092 & 13-0105) | 06Sep2013 | Matrix spike beyond recovery limits (NO ₂ -N+NO ₃ -N & TKN) | Associated sample data to be flagged with “SR” in data submittal. No specific corrective action identified. Lab will continue to monitor for trends. | 01Oct2013 |
| 2 (CAR 13-0097) | 06Sep2013 | Quanti-Tray comparator for <i>E. coli</i> analysis was used past expiration | Expired comparator was checked against new comparator. Added comparator expiration date to monthly maintenance check schedule. | 10Jan2014 |
| 3 (CAR 13-0101) | 06Sep2013 | Field filtration of NO ₂ -N+NO ₃ -N and PO ₄ -P was unable to occur. | Field crew directed to use alternative parameter codes as outlined in the QAPP. Field personnel reminded to verify that loaded equipment matches the items on the equipment check list, which is located in the Nolan field notebooks. | 03Sep2013 |
| 4 (CARs 13-0137 & 13-0138) | 12Dec2013 | Matrix spike beyond recovery limits (NO ₂ -N+NO ₃ -N & PO ₄ -P) | Associated sample data to be flagged with “SR” in data submittal. No specific corrective action identified. Lab will continue to monitor for trends. | 13Jan2014 |
| 5 (CARs 14-0022, 14-0031 & 14-0038) | 05Jun2014 | Matrix spike beyond recovery limits (PO ₄ -P, NO ₂ -N+NO ₃ -N & TKN) | Associated sample data to be flagged with “SR” in data submittal. No specific corrective action identified. Lab will continue to monitor for trends. | |
| 6 (CAR 14-0031) | 05Jun2014 | Sonde incorrectly calibrated for specific conductance | Field personnel instructed to review calibration procedures prior to next monitoring event. Data omission to be noted with data submittal. | 27May2014 |

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**Attachment #1
Minutes from Quarterly Project Coordination Meeting**

Date: May 28, 2014

Time: 9:30 am

Location: TCEQ Offices, Austin, TX

Attendees:

TIAER – Anne McFarland, Leah Taylor, and Kalyn Brymer

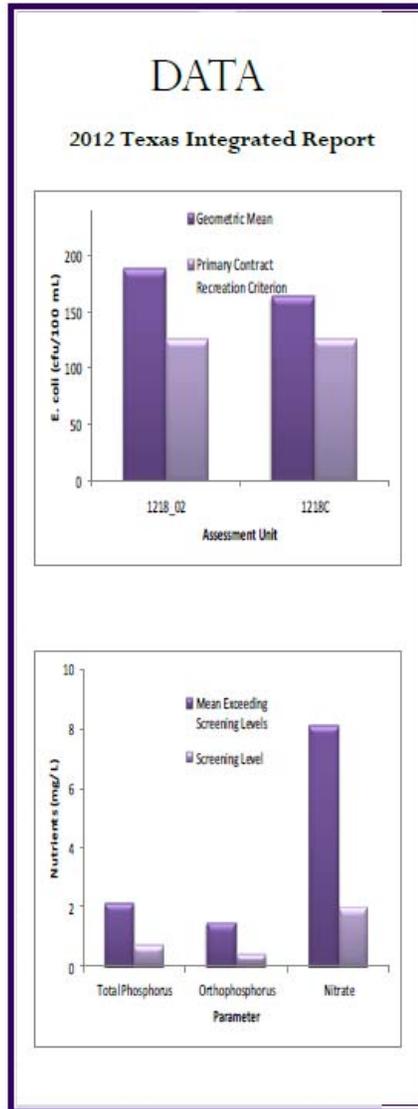
TIAER – Anju Chalise and Arthur Talley

Minutes Drafted by Anne McFarland

Meeting held to update TCEQ on change in TIAER project personnel and update on project status. Major points are noted below:

- Nikki Jackson will be leaving TIAER as of June 1, 2014, and will no longer be the TIAER project manager. At the time of this meeting, the TIAER director had not formally assigned a new project manager and a letter will be forthcoming to TCEQ.
- The meeting was held to introduce Leah Taylor and Kalyn Brymer to the TCEQ project manager. Ms Taylor will be taking over the stakeholder and educational outreach with assistance from Ms Brymer.
- Anju Chalise, the TCEQ project manager, informed TIAER staff that she would be on vacation from June 11 through July 25, 2014 and during this time, Arthur Talley would be the interim project manager for TCEQ.
- Anne McFarland gave an overview of the current status of tasks. With regard to the timeframe during which Anju Chalise will be on vacation, there are no public meetings planned. The next public meeting will likely occur either in late August or early September. Anne noted that Task 4, dealing with the data inventory, has been delayed and TIAER is working closely with the City of Killeen, a project subcontractor, to get this task completed. In the interim, TIAER plans to move forward with the SELECT modeling using readily available data and will refine GIS layers later as more refined data from City of Killeen becomes available.

Attachment #2 – Educational Flyer



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Texas Institute for Applied
Environmental Research

NOLAN CREEK/
SOUTH NOLAN CREEK
PROJECT
BACKGROUND



WATER QUALITY STANDARDS

Water Quality Standard

- The designated beneficial uses of a water body and the water quality criteria necessary to protect those uses

Clean Water Act

- Requires States to establish Water Quality Standards to achieve objectives and goals of the Act
- Requires Texas to identify water bodies failing to meet or not expected to meet water quality standards and not supporting their designated uses

Texas Water Quality Inventory & 303(d) List

- The list of Texas impaired water bodies



Station 18828, South Nolan Creek
 at 38th St
 (15Oct2013)

NOLAN CREEK/SOUTH NOLAN CREEK IMPAIRMENTS

(SEGMENT 1218)

| 2012 Texas 303(d) List Assessment Units | Impairments or Concerns: |
|---|---|
| <ul style="list-style-type: none"> • 1218_02—South Nolan at Liberty Ditch in Killeen to the confluence with North Nolan Creek west of Belton • 1218C—Little Nolan Creek in and south of Killeen | <ul style="list-style-type: none"> • Bacteria Impairment and Concerns for Nutrients • Bacteria Impairment |

Why Bacteria?

- Elevated levels of bacteria (*E. coli*, fecal coliform) indicate possible fecal contamination influencing recreational use
- Potential presence of disease-causing pathogens that may result in illness if ingested

Why Nutrients?

- Nitrates cause potential human health issues if high concentrations occur in drinking water
- Elevated Nitrogen & Phosphorus concentrations raise environmental concerns in that they can cause excessive algae growth in surface waters also known as accelerated eutrophication

(Nolan Creek is NOT currently listed for excessive algae.)

PROJECT GOALS

1. Evaluate potential sources
 - Geographical inventory
 - Water quality monitoring program
 - ♦ Focuses on *E. coli* but also includes nutrients
 - ♦ Monthly routine sampling
 - 11 sampling stations
 - ♦ Quarterly storm sampling stations
 - 4 sampling stations
2. Identify targeted control practices
3. Identify future watershed needs

The ultimate goal of the data collection and analysis effort is to remove water bodies in the study area from the 303(d) List; however, the mechanism is not predetermined.

NIKKI JACKSON

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