TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

April 23, 2013

Lee Weatherford
City of Lockhart
705 Wichita
Lockhart, Texas 78644

Re: City of Lockhart Storm Water System Map Quality Assurance Project Plan (QAPP)

Approved: April 22, 2013

Dear Mr. Weatherford:

The above named QAPP has been approved. The original document and signature pages are enclosed as documentation of approval.

In accordance with the terms of the QAPP, **please ensure that copies of this document and any subsequent amendments are distributed to each sub-tier participant as noted in Section A3 of the QAPP.** This approval letter must be available for review during a monitoring systems audit.

Should you have questions, please contact me at (512) 239-0425.

Sincerely,

Kyle Girten
Quality Assurance Specialist

enclosure

cc: Sharon Coleman, Senior Quality Assurance Specialist, MC 165
Anju Chalise, Project Manager, MC 203

City of Lockhart Storm Water System Map

Quality Assurance Project Plan

City of Lockhart
P.O. Box 239
Lockhart, TX 78644

Funding Source: *Fiscal Year 2009*
Federal Grant # 99614614

Nonpoint Source Program CWA §319(h)
Prepared in cooperation with the Texas Commission on Environmental Quality
and the U.S. Environmental Protection Agency
Federal ID # 99614614

Effective Period: One year from date of final approval

Questions concerning this quality assurance project plan should be directed to:

Lee Weatherford
Director, Public Works
P.O. Box 239
Lockhart, Texas 78644
(512) 398-6452
gweatherford@lockhart-tx.org

A1 APPROVAL PAGE

Texas Commission on Environmental Quality

Office of Water, Water Quality Planning Division

Planning and Implementation Section

4/19/13
Kerry Niemann, Team Leader (Acting) Date
Nonpoint Source Program

Anju Sharma Chalise for Jack
4/17/2013
Jack Higginbotham, Project Manager Date
Nonpoint Source Program

Anju Sharma Chalise
4/17/2013
Anju Chalise, NPS QA Specialist Date
Nonpoint Source Program

Monitoring Division

Sharon Coleman
4/22/2013
Sharon Coleman, Manager Date
TCEQ Quality Assurance Manager

4/24/13
Kyle Girten, NPS Lead Quality Assurance Specialist Date
Quality Assurance Team

CITY OF LOCKHART

Lee Weatherford, Project Manager 3.25.13 Date

Debbie Magin, QA Officer 3/26/13 Date

TRC

Charles Scheler, Project Manager 4/4/13 Date

Adrienne Boer, QA Officer 4/4/13 Date

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A3 LIST OF ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practice
CWA	Clean Water Act
EPA	Environmental Protection Agency
GPS	Global Positioning System
MCM	Minimum Control Measures
MS4	Municipal Separate Storm Sewer System
NOI	Notice of Intent
PCWP	Plum Creek Watershed Partnership
SWMP	Storm Water Management Plan
TCEQ	Texas Commission on Environmental Quality
TAC	Texas Administrative Code
TPDES	Texas Pollutant Discharge Elimination System
WPP	Watershed Protection Plan

A4 DISTRIBUTION LIST

Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

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MC-203
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505 E. Huntland Drive
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Austin, TX 78752

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Adrienne Boer, Quality Assurance Officer
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Charles Scheler, Project Manager
(512) 684-3172

U.S. Environmental Protection Agency Region 6
State/Tribal Section
1445 Ross Avenue
Suite # 1200
Dallas, TX 75202-2733

Anthony Suttice, Project Officer
(214) 665-7345

The City of Lockhart will secure written documentation from additional project participants (e.g., subcontractors) stating the organization's awareness of and commitment to requirements contained in this quality assurance project plan and any amendments or revisions of this plan. The City of Lockhart will maintain this documentation as part of the project's quality assurance records. This documentation will be available for review.

The TCEQ Project Manager is responsible for providing copies of the project plan and any amendments or revisions of this plan to TCEQ staff other than the TCEQ QA Specialist. Copies must be provided within two weeks of QAPP approval, and documentation of this transmittal will be available for review and maintained as part of the NPS project file.

SECTION 1.0, PROJECT OBJECTIVES, ORGANIZATION, AND RESPONSIBILITIES

1.1 PROBLEM DEFINITION/BACKGROUND

The City of Lockhart received grant funding from TCEQ to develop a Storm Water Management and Drainage Plan, in an effort to improve water quality to Plum Creek and determine improvements to the City's drainage system.

The Plum Creek Watershed Partnership (PCWP), composed of local stakeholders, was formed to increase awareness of water resource issues and protect and restore water quality in the Plum Creek Watershed. The PCWP developed a Watershed Protection Plan (WPP) that outlines control measures and compliance strategies for reducing discharges of pollutants into Plum Creek with the goal of improving water quality in the watershed. Using the WPP, the City of Lockhart is implementing a storm water management program that will assist in locating and identifying sources of contamination that are contributing to the decline in water quality in the watershed.

1.2 PURPOSE

The City of Lockhart developed a map of the City's storm water conveyance system using a global positioning system (GPS) and geographical information system (GIS). The map identifies the locations of inlets and flow paths, and differentiates between open ditches and enclosed drainage. The map allows better decision-making in planning efforts and response to NPS pollution issues and emergencies. The map will be used to identify sources of illicit discharges found during the City's illicit discharge survey.

1.3 OBJECTIVES

The objective of geospatial referencing is to actively map and manage the City of Lockhart and surrounding area storm water system, including location of inlets, flow paths, and differentiating between open ditches and enclosed drainage allowing better decision making in planning efforts and response to NPS pollution issues or emergencies. An illicit discharge survey was conducted in the City using the EPA guidance "Illicit Discharge and Detection; A Guidance Manual for Program Development and Technical Assistance," http://cfpub.epa.gov/npdes/, and methods described in Center for Watershed Protection's "Methods for detecting Illicit Discharges in the Field," by Julie Tasillo and Ted Brown, www.cwp.org/RR_photos/PA_SW_Symposium_IDDE.pdf. GPS data were collected in the field by qualified individuals using professional-grade GPS receivers (described below) to locate and map the storm water system using TCEQ's OPP 8.11 and 8.12 policy regarding the collection and management of positional data.

1.4 PROJECT/TASK DESCRIPTION

Both secondary data and primary data were used and collected to populate the geospatial database to fulfill the City's mapping need. The secondary data sources are listed in Table 4.1.1 and primary data sources are listed in Table 2.3. Data includes: GIS base map layers; existing

geospatial data; digitized data from hard copy datasets; new geolocated features; and IDDE survey information. Primary field data including base map features along with the IDDE survey information were collected in the field with a Trimble 6000 series GeoXH decimeter/centimeter hand-held GPS. The GPS data was then used to populate the geospatial database and generate the City's storm water map. Typical basemap features collected included bridges, culverts, ditches, detention ponds, manholes, and their associated physical attributes. Typical primary data fields collected for the IDDE survey and added to create the geospatial database included location description, antecedent dry period, type of structure, shape of structure, type of material, dimensions, staining, deposits, odor, flow volume, flow color, turbidity, floatables, classification, physical condition, photographs, potential receiving water of the state and general comments about the feature.

Amendment to the QAPP – Amendments to the QAPP may be necessary to reflect changes in project organization, tasks, schedules, objectives, and methods; address deficiencies and nonconformance's; improve operational efficiency; and/or accommodate unique or unanticipated circumstances. Requests for amendments are directed from the contractor Project Manager to the TCEQ Project Manager in writing using the QAPP Amendment shell. The changes are effective immediately upon approval by the TCEQ NPS Project Manager and Quality Assurance Specialist, or their designees.

Revisions to the QAPP - Until the work described is completed, this QAPP shall be reissued annually on the anniversary date, or revised and reissued prior to any significant changes being made in activities, whichever is sooner. Reissuances and annual updates must be submitted to the TCEQ for approval at least 90 days before the last approved version has expired. If the QAPP expires, the QAPP is longer in effect and the work covered by the QAPP must be halted. If the entire QAPP is current, valid, and accurately reflects the project goals and the organization's policy, the annual re-issuance may be done by a certification that the plan is current. This can be accomplished by submitting a cover letter stating the status of the QAPP and a copy of new, signed approval pages for the QAPP. If the QAPP needs to be updated to incorporate amendments made earlier in the year or to incorporate new changes, a full annual update is required. This is accomplished by submitting a cover letter, a document detailing changes made, and a full copy of the updated QAPP (including signature pages).

1.5 DATA ANALYSIS

No specific data analysis will be conducted. However, the City of Lockhart and other stakeholders in the Plum Creek Watershed will participate in an evaluation of the project effectiveness and use.

1.6 PROJECT PARTICIPANTS AND RESPONSIBILITIES

TCEQ

Kerry Niemann
Nonpoint Source Program Team Leader
Responsible for supervising the TCEQ NPS Team and staff. Oversees the development of QA guidance for the NPS Team to ensure it is within pertinent frameworks of the TCEQ. Reviews and/or approves all NPS projects, QA audit responses, QAPPs, agency QMPs, corrective action reports, work plans, and contracts. Enforces corrective action where QA protocols are not met. Ensures TCEQ NPS personnel are fully trained.

Jack Higginbotham
Nonpoint Source Project Manager
Responsible for ensuring that the project delivers data of known quality and quantity on schedule to achieve project objectives. Provides the primary point of contact between City of Lockhart and the TCEQ. Tracks and reviews deliverables to ensure that tasks in the work plan are completed as specified in the contract. Reviews and approves QAPPs and any amendments or revisions and ensures proper distribution of approved/revised QAPPs to TCEQ participants. Responsible for verifying that the QAPP is followed by City of Lockhart. Notifies the NPS QAS, and NPS Program Team Leader of significant project nonconformance's and corrective actions taken as documented in CARs and/or quarterly progress reports.

Anju Chalise
NPS Quality Assurance Specialist
Assists the Lead QAS with NPS QA management. Serves as liaison between NPS management and Agency QA management. Responsible for NPS guidance development related to program quality assurance. Serves on planning team for NPS projects. Participates in the development, approval, implementation, and maintenance of the QAPP.

Kyle Girten
Monitoring Division Division, Lead NPS Quality Assurance Specialist
Assists the NPS Program Manager and Project Manager on QA-related issues. Coordinates, reviews and approves QAPPs and amendments or revisions. Prepares and distributes annual audit plans. Conveys QA problems to appropriate TCEQ management. Monitors implementation of corrective actions. Coordinates and conducts audits. Ensures maintenance of QAPPs and audit records for the NPS program.

CITY OF LOCKHART

Lee Weatherford
City of Lockhart Project Manager
The City of Lockhart Project Manager is responsible for ensuring that all tasks and other requirements in the contract are executed on time and with the quality assurance/quality control requirements as defined by the contract and in the project QAPP; assessing the quality of subcontractor/participant work; submitting accurate and timely deliverables to the TCEQ NPS Project Manager; and coordinating attendance at conference calls, trainings, meetings, and related project activities with the TCEQ. Responsible for verifying that the QAPP is distributed and followed by City of Lockhart (including all subcontractors). Responsible for maintaining written records of sub-tier commitment to requirements specified in this QAPP.

Debbie Magin
Guadalupe Blanco River Authority Quality Assurance Officer
Responsible for coordinating development and implementation of City of Lockhart's QA program. Responsible for writing and maintaining QAPPs and monitoring their implementation. Responsible for maintaining records of QAPP distribution, including appendices and amendments. Responsible for identifying, receiving, and maintaining project quality assurance records. Responsible for compiling and submitting the QA report. Responsible for coordinating with the TCEQ QAS to resolve QA-related issues. Notifies the City of Lockhart Project Manager and TCEQ Project Manager of particular circumstances which may adversely affect the quality of data. Conducts assessments of participating organizations during the life of the project. Coordinates and monitors nonconformances and corrective actions. Also implements or ensures implementation of corrective actions needed to resolve nonconformances noted during assessments.

Lee Weatherford
City of Lockhart Data Manager
Responsible for the acquisition, verification, and transfer of data to the TCEQ NPS Project Manager. Oversees data management for the project. Conducts data summarization analyses on the project. Provides the point of contact for the TCEQ NPS Project Manager to resolve issues related to the data and assumes responsibility for the correction of any data errors.

TRC

Charles Scheler
TRC Project Manager
The TRC Project Manager is responsible for ensuring that all tasks and other requirements in the contract are executed on time and with the quality assurance/quality control requirements as defined by the contract and in the project QAPP; assessing the quality of work; submitting accurate and timely deliverables to the City of Lockhart Project Manager. Responsible for verifying that the QAPP is distributed to all TRC staff.

Adrienne Boer
TRC Quality Assurance Officer
Responsible for identifying, receiving, and maintaining project quality assurance records. Responsible for compiling and submitting the QA report. Notifies the City of Lockhart Project Manager of particular circumstances which may adversely affect the quality of data. Coordinates the research and review of technical QA material and data related to geospatial referencing design and analytical techniques. Coordinates and monitors nonconformance's and corrective actions. Also implements or ensures implementation of corrective actions needed to resolve nonconformance's noted during assessments.

Cory Laskoskie
TRC Data Manager
Responsible for the acquisition, verification, and transfer of data to the City of Lockhart NPS Project Manager. Oversees data management for the project. Conducts data summarization analyses on the project. Provides the point of contact for the City of Lockhart NPS Project Manager to resolve issues related to the data and assumes responsibility for the correction of any data errors.

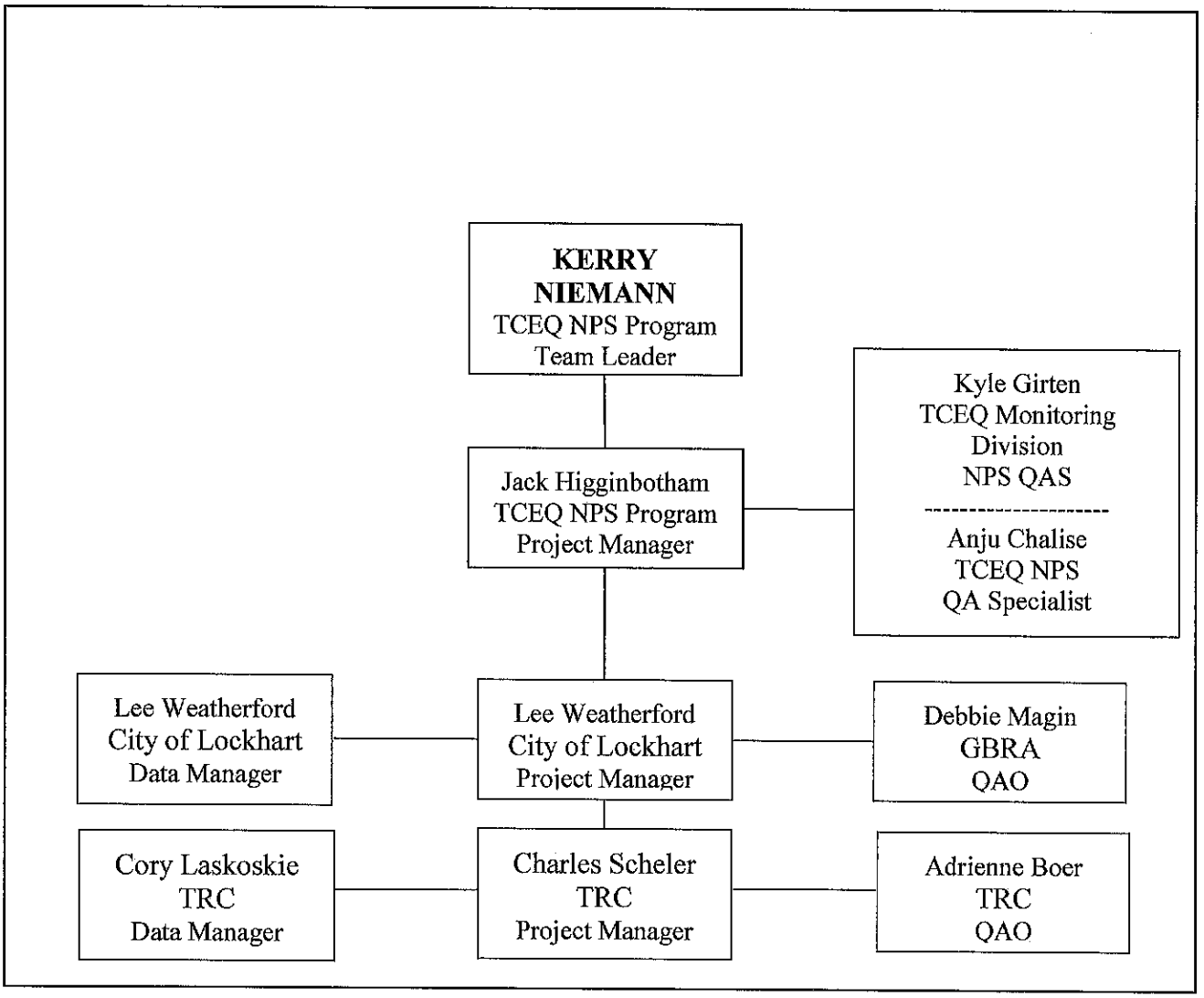


FIGURE 1.6.1 ORGANIZATION CHART

SECTION 2.0, PRIMARY DATA COLLECTION

2.1 SOURCES OF PRIMARY DATA

The primary data sources included: GPS data points for bridges, culverts, ditches, inflow, inlets, other structures, outfalls, outflows, and manholes; polygon data digitized from aerials for storm water detention ponds; line data digitized from aerials and connected to GPS point data for channels, culverts and ditches; line data converted from hard copy maps and AutoCAD files and connected to GPS point data for storm water lines.

2.2 SOURCE SELECTION RATIONALE

Primary field data including base map features along with the IDDE survey information were collected, used to populate the geospatial database and generate the City's storm water map. The objective is to actively map and manage the City of Lockhart and surrounding area storm water system, including location of inlets, flow paths, and differentiating between open ditches and enclosed drainage allowing better decision making in planning efforts and response to NPS pollution issues or emergencies.

2.3 IDENTIFICATION OF SOURCES

2.3 SOURCE(S) OF PRIMARY DATA

Table 2.3 List of GIS Layers for Mapping Application

GIS Data	Type	Source	Comments/Metadata
Bridges	Primary	GPS Point	GPS data collection, 2011-2012
Culverts	Primary	GPS Point	GPS data collection, 2011-2012
Ditches	Primary	GPS Point	GPS data collection, 2011-2012
Inlets	Primary	GPS Point	GPS data collection, 2011-2012
Other Structures	Primary	GPS Point	GPS data collection, 2011-2012
Outfalls	Primary	GPS Point	GPS data collection, 2011-2012
Manholes	Primary	GPS Point	GPS data collection, 2011-2012
Storm water Detention Pond	Primary	Polygon	Digitized from aerials, 2011-2012
Channels	Primary	Line	Digitized from aerials and connected to GPS Points, 2011-2012
Culverts	Primary	Line	Digitized from aerials and connected to GPS Points, 2011-2012
Ditches	Primary	Line	Digitized from aerials and connected to GPS Points, 2011-2012
Storm water Lines	Primary	Line	Converted from hard copy maps and AutoCAD files and connected to GPS Points, 2011-2012

2.4 SAMPLING PROCESS DESIGN

Sections 2.5 through 2.12 address various quality aspects of the design and procedures for collecting, handling, and analyzing new environmental data.

2.5 SAMPLING METHODS

When conducting collection of new GPS data, the use of base stations was required in order to derive correctional information for nearby GPS receivers for use in differential correction. All GPS measurements were taken using a set of four satellites which were in a favorable configuration. The Positional Dilution of Precision (PDOP) is a recognized method to quantify how well the satellites are configured.

2.6 SAMPLE HANDLING AND CUSTODY

TRC provided data to City of Lockhart in shapefile format, which was used for GIS queries. Data was sent via FTP from TRC to City of Lockhart and stored on desktop hard drives by the individual project GIS specialist as well as on network drives. Working files were stored and backed up on the project network directory.

2.7 ANALYTICAL METHODS

Data collectors using GPS utilized real-time differential correction techniques whenever possible. The real-time correction component must receive correction data from a recognized, reliable source appropriate for real-time correction in the geographic area in which the GPS locations is collected. All submitted data were differentially corrected.

2.8 QUALITY CONTROL

All data generated were fully documented as to the original source, quality, and history. GPS locational points were checked and compared to high resolution aerial photography. GPS coordinates were compared against the results of ground surveys at the site where GPS coordinates were taken.

2.9 INSTRUMENT/EQUIPMENT, TESTING, INSPECTION, AND MAINTENANCE

GPS units used to collect data were required to meet the minimum qualifications outlined in TCEQ OPP 8.12. At a minimum, GPS units used to collect data must be accurate to no less than 2-5 meters when differentially corrected. The Trimble 6000 series GeoXH decimeter/centimeter hand-held GPS used on this project was sub-meter accuracy. The GPS used for this project was

selected for the high accuracy data collection with the ability to take photos of outfalls and other structures.

2.10 INSTRUMENT/EQUIPMENT, CALIBRATION, AND FREQUENCY

Data correction techniques were used and GPS units set up in such a manner as to achieve expected data accuracy and precision goals outlined in TCEQ OPP 8.12. Higher accuracy standards and precision goals were achieved when possible with the Trimble 6000 series GeoXH GPS unit.

2.11 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Does not apply to this QAPP.

SECTION 3.0, QUALITY OF PRIMARY DATA

3.1 QUALITY REQUIREMENTS

For the purposes of this project, the acceptable horizontal error in the mapped location of a feature is 1 meter when differentially corrected. This value was determined to be acceptable to meet TCEQ data collection standards for hand-held GPS devices.

3.2 PROCEDURES FOR DETERMINING DATA QUALITY

The primary field data were post-processed using Trimble Pathfinder Office to differentially correct the data to ensure the highest accuracy possible. Only differentially corrected data were used for mapping purposes. The primary GIS data were overlain on an aerial photo and visually inspected by City of Lockhart subcontractor staff. When the positional error of any feature was measured/suspected to be over 1 meter, the location of the feature was geolocated again. Feature parameters were reviewed following collection by City of Lockhart subcontractor staff to ensure accuracy and consistency between the data collected and the photos taken for base mapping and IDDE survey.

3.3 QUALITY REQUIREMENTS DISCLAIMER

Metadata were developed for the GIS layer(s) stating all data sources and any data limitations.

3.4 SPECIAL TRAINING/CERTIFICATION

GPS data collection training and qualifications requirements were based on TCEQ OPP 8.12. The requirements were met through sufficient GPS expertise and experience using Trimble R8 GPS surveying system, Trimble Pathfinder Pro XRS Backpack GPS unit, Trimble GeoXT GPS unit, and Trimble 6000 series GeoXH GPS on multiple projects. The staff involved in the GPS

data collection have between 2 and 15 years' experience collecting GPS data, including use of the equipment described above.

SECTION 4.0, SOURCES OF SECONDARY DATA

4.1 SOURCE(S) OF SECONDARY DATA

Table 4.1.1 List of GIS Layers for Mapping Application

GIS Data	Secondary/Primary	Source	Comments/Metadata
Texas Stream Segments	Secondary	TCEQ	Official TCEQ Segments at the segment level for the State of Texas as listed in Title 30, Chapter 307 of the Texas Administrative Code (TAC), also known as the Surface Water Quality Standards. This layer also indentifies which segments and water bodies have been assessed in the DRAFT 2010 Texas Integrated Report for Clean Water Act Sections 305 (b) and 303 (d).
National Hydrography Dataset	Secondary	USGS	The National Hydrography Dataset (NHD) is a feature-based database that interconnects and uniquely identifies the stream segments or reaches that make up the nation's surface water drainage system.
Parcels	Secondary	CAPCOG	2008
City Limit	Secondary	CAPCOG	Caldwell County Appraisal District
ETJ	Secondary	CAPCOG	Caldwell County Appraisal District
Roads	Secondary	CAPCOG	Caldwell County Appraisal District
Aerial Photos	Secondary	CAPCOG	2009
Aerial Photos	Secondary	NAIP	2010
2 Foot Contours	Secondary	City of Lockhart	2007

4.2 SOURCE SELECTION RATIONALE

The City of Lockhart and CAPCOG data were used as the highest quality publically available datasets for this area. The Plum Creek watershed layer was developed by TCEQ and is the official area for the Plum Creek Watershed Protection Plan (WPP). The Texas Stream Segments layer is the official designated stream segments layer for the state.

A kiosk will be placed in the city park as part of this project and a map of the area will be acquired from a public source. The map will be used as part of an educational display and not required to be of high quality and accuracy.

4.3 IDENTIFICATION OF SOURCE(S)

Data sources are identified in a column in the database. Metadata were developed for the GIS layer(s) stating all data sources and any data limitations. The sources of the secondary and primary data gathered will be identified on all project deliverables.

SECTION 5.0, QUALITY OF SECONDARY DATA

5.1 QUALITY REQUIREMENTS

The CAPCOG and City of Lockhart basemap layers and the TCEQ watershed and segment layers were considered to be of appropriate quality considering the data source and metadata shown in Table 4.1.1.

5.2 PROCEDURES FOR DETERMINING DATA QUALITY

The secondary GIS data was overlain on high resolution aerial photos and visually inspected by City of Lockhart subcontractor staff to insure the data met mapping standards.

5.3 QUALITY REQUIREMENTS DISCLAIMER

Metadata were reviewed for the CAPCOG and TCEQ data to determine all data sources and any data limitations.

5.4 SPECIAL TRAINING/CERTIFICATION

No special training or certifications were required to evaluate data for this project.

SECTION 6.0, DATA REPORTING, DATA REDUCTION, AND DATA VALIDATION

6.1 DATA REDUCTION PROCEDURES

The database was set up to allow for different attributes of data to be collected dependant upon the significance of the feature collected. Data were reviewed to determine what information should be integrated into the database. Unnecessary information was not incorporated into the database. The original raw GPS data, corrected GPS data, and base station data were not included in the database. Individual daily shapefiles were merged into one feature class in the database for data reduction. Data reduction was not necessary for the secondary data sources.

6.2 DATA MANAGEMENT

Primary source data were downloaded daily from the GPS to the TRC server to ensure that no data were lost from the GPS. The data were post-processed with Trimble Pathfinder Office to ensure the highest horizontal accuracy. The raw data and the differentially corrected data were retained to ensure a redundant backup system. The primary and secondary data stored on the server are backed up from the server to a separate storage device daily for changes with a full backup every Friday. 100% of the data were then quality checked by desktop review to ensure positional accuracy and consistency. The daily data were then merged together into one dataset to insure the original dataset were not corrupted. 25% of the merged data were quality checked by a separate reviewer to insure completeness and accuracy of the dataset before final approval. The data collected will subsequently be used to prepare GIS maps and assemble a geospatial database of information.

6.3 ASSESSMENTS AND RESPONSE ACTIONS

Table 6.3.1 Assessments and Response Requirements

Assessment Activity	Approximate Schedule	Responsible Party	Scope	Response Requirements
Status Monitoring Oversight, etc.	Continuous	Contractor Project Manager	Monitoring of the project status and records to ensure requirements are being fulfilled.	Report to TCEQ in Quarterly Report
Site Visit	Dates to be determined by TCEQ	TCEQ PM	Status of activities. Overall compliance with work plan and QAPP	As needed

Corrective Action Process for Deficiencies

Deficiencies are any deviation from the QAPP, SWQM Procedures Manual, SOPs, or Data Management Reference Guide. Deficiencies may invalidate resulting data and may require corrective action.

Corrective actions and resolutions will be conveyed to the NPS Project Manager both verbally and in writing in the project progress reports and by completion of a corrective action plan (CAP).

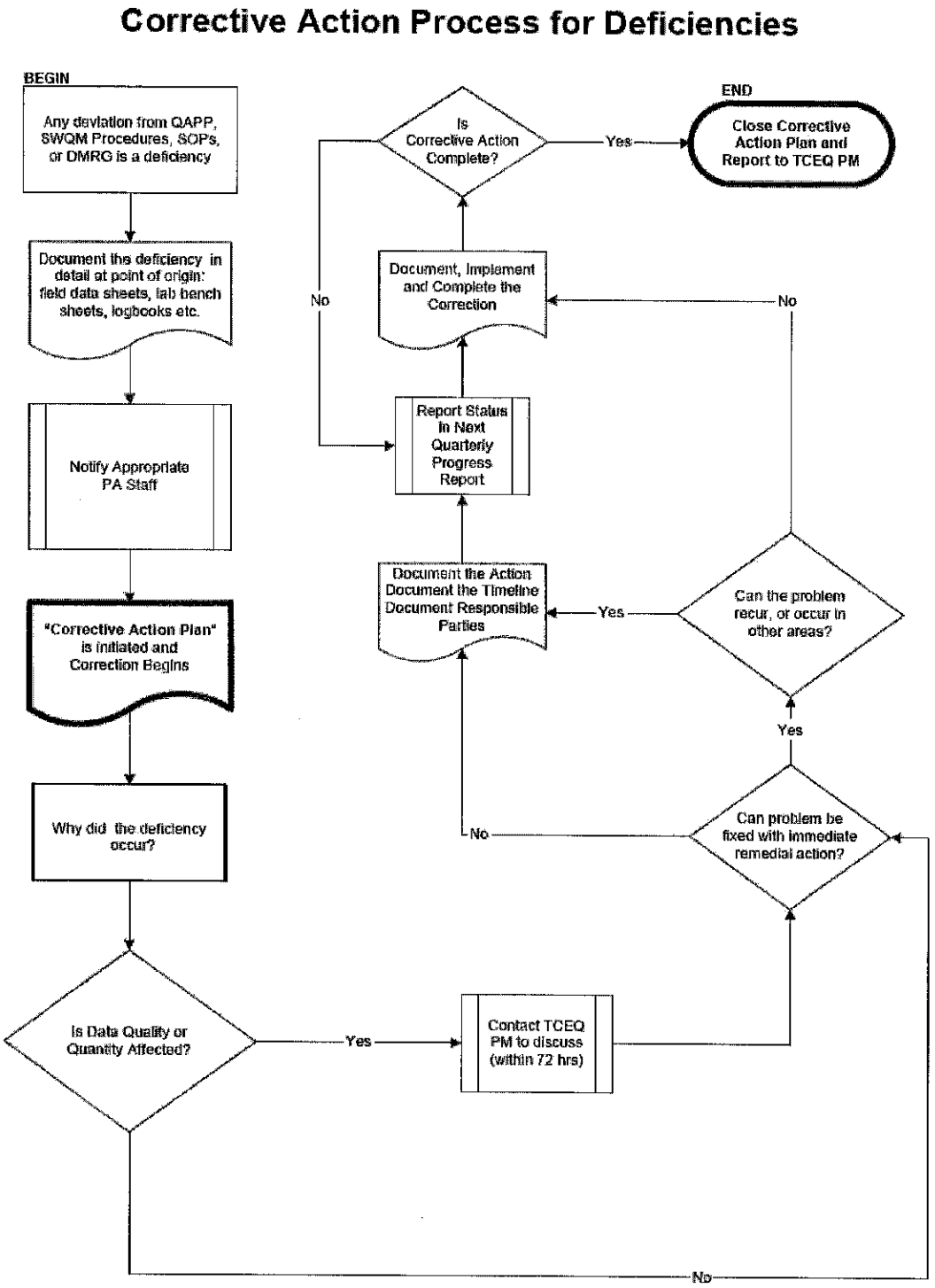
Corrective Action

CAPs should:

- Identify the problem, nonconformity, or undesirable situation
- Identify immediate remedial actions if possible
- Identify the underlying cause(s) of the problem
- Identify whether the problem is likely to recur, or occur in other areas
- Evaluate the need for Corrective Action
- Use problem-solving techniques to verify causes, determine solution, and develop an action plan
- Identify personnel responsible for action
- Establish timelines and provide a schedule
- Document the corrective action

To facilitate the process the following flow chart should be followed (see figure 4.3.1: Corrective Action Process for Deficiencies).

Figure 6.3.1 Corrective Action Process for Deficiencies



6.4 DATA VALIDATION PROCEDURES

The database was inspected/validated by City of Lockhart staff to ensure parameter information accuracy.

The GIS data (both secondary and primary) were overlain on an aerial photo and visually inspected by City of Lockhart/TRC staff. When the positional error of primary datawas measured/suspected to be over 1 meter then the location of the feature was geolocated again. Data fields were reviewed following collection by City of Lockhart subcontractor staff to ensure accuracy and consistency between the data collected and the photos taken for base mapping and IDDE survey. Any inconsistency between the data collected and the photos were resolved through consultation with field personnel. Only verified and validated data were included in data compiled for database entry.

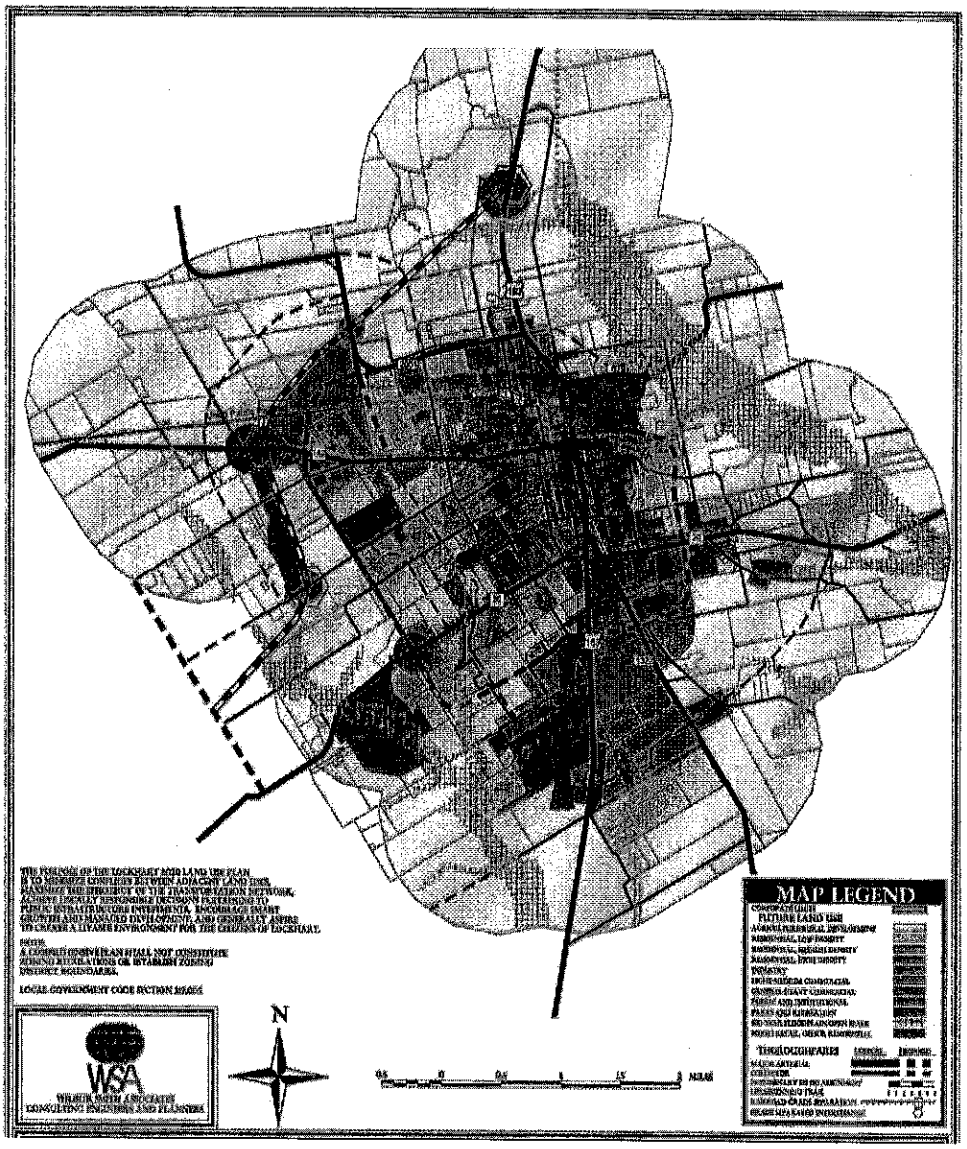
6.5 RECONCILIATION WITH USER REQUIREMENTS

The development of this information database will facilitate use of the information to achieve the overall storm water mapping and management goals. Project deliverables will be reviewed internally by the City of Lockhart subcontractor staff and externally by the City of Lockhart to insure they meet TCEQ's requirements.

6.6 FINAL PROJECT DOCUMENT(S)

A storm water system map will be posted on the City's website. Information regarding Task 2 of TCEQ contract 582-10-90465 will be included in the Final Report. The database files will be submitted to the City of Lockhart.

APPENDIX A. AREA LOCATION MAP


MAP LEGEND
N

APPENDIX B. WORK PLAN