0.0 EXECUTIVE SUMMARY

Lake Granbury is an impoundment of the Brazos River that lies fully within Hood County, Texas. The City of Granbury, the City of DeCordova Bend, and numerous residential developments surround this reservoir. Since the mid-1990s this reservoir has been identified by the stakeholders of Hood County as a priority water body for protection and restoration. The coves and canals of Lake Granbury exhibit elevated bacteria concentrations related to nonpoint source (NPS) water pollution from the surrounding watershed. These nonpoint bacteria sources can be controlled through an integrated program of education and voluntary compliance with best management practices (BMP). The effectiveness of implementing BMPs will be evaluated through water quality monitoring.

Periodic elevated concentrations of *E. coli* and fecal coliform bacteria have been found in the coves of Lake Granbury, causing a failure to meet the criteria for contact recreation use. A substantial portion of the developed area around Lake Granbury, which lies wholly within Hood County, consists of unincorporated subdivisions that do not have centralized sewage collection systems or treatment facilities. There are an estimated 9,000 on-site sewage facilities (OSSF) located around Lake Granbury with absorption fields installed on small lots in close proximity to the lake. Most of the inhabited areas around the lake exist on man-made coves. The coves are shallow, dead-end bodies of water with little mixing or interaction with the main body of the reservoir. New development in areas without collection and treatment systems relies on individual on-site sewage facilities and absorption fields.

In response to the concerns of stakeholders, the Brazos River Authority, in collaboration with the local stakeholders, embarked upon an effort to develop the Lake Granbury Watershed Protection Plan (WPP). This plan was developed as a "community-driven" plan that reflects the local stakeholders' concerns and water quality data. The overall objective of the Lake Granbury WPP is to improve and protect the chemical, physical and biological integrity of Lake Granbury and its designated uses. This plan identifies the shared vision of watershed residents, local governments, state agencies and elected officials. Stakeholder input has been used at all stages of the Lake Granbury WPP development to determine the source identification activities performed, develop specific water quality goals for Lake Granbury, and determine what solutions can most effectively be used to protect water quality for future generations. The WPP includes an inventory of the watershed, water quality assessment, subwatershed specific data, problem statements, goals, implementation strategies, monitoring and potential funding sources. The implementation plan sets goals and tasks for the reduction of pollutants that enter the lake.

Major findings and outcomes of this stakeholder-driven WPP development process are:

- While bacteria problems are not exhibited within the main body of the lake, elevated bacteria levels are exhibited in specific coves and canal water bodies attached to the lake
- Of numerous areas identified and 21 areas studied in detail by the stakeholders, 13 subdivision areas adjacent to the lake are targeted for specific future strategies to reduce bacteria loads
- Bacteria loading reductions within the isolated drainage areas of identified areas can significantly impact bacteria levels in identified areas; bacteria loading reductions in distant areas of the Lake Granbury watershed would not significantly impact bacteria levels within the identified areas

- Around the lake, four subdivision canal areas consistently exhibit undesirable bacteria conditions and improvement strategies are prioritized for these areas
- Bacteria source identification methods were relied-upon, including land use analysis, watershed modeling and lake water quality modeling
- A single source of bacteria is not evident for all areas of the lake; aging septic systems are a primary potential source in many areas while other areas are susceptible to a variety of sources including septic system, urban, wildlife and agricultural sources

Most Likely Bacteria Sources identified by watershed modeling of potential sources

Area	Most likely sources
Rolling Hills Shores	62% Septic, 38% Cattle, <1% Pets,<1%Deer
Arrowhead Shores	99% Septic, <1% Pets, <1% Deer
Oak Trail Shores	54% Septic, 46% Pets
Sky Harbor	82% Cattle, 13% Septic, 4% Pets, 2% Feral Hog
Nassau Bay II	98% Septic, 2% Pets
Waters Edge	Very low potential; Pets
Ports O' Call	>99% Septic, <1% Pets
Indian Harbor Cove	99% Septic, 1% Pets
Indian Harbor Canal	98% Septic, 2% Pets
Port Ridglea East	>99% Septic, <1% Pets
Blue Water Shores	Pets
Long Creek - Watershed	<98% Cattle, 2% Feral Hog, <1% Pets, <1% Deer
Long Creek - Cove	>99% Septic, <1% Pets
Walnut Creek	96% Cattle, 2% Feral Pets, <1% Pets, <1% Deer
McCarthy Branch	94% Cattle, 3.5% Pets, 2% Feral Hog, <1% Septic

- A bacteria (*E. coli*) goal for lake waters was identified by the stakeholder group: geometric mean less than or equal to 53 MPN/100mL

***E.coli* Reductions Needed to Meet Stakeholder Goal**

Area	% *E. coli* Reduction
Port Ridglea East	27
Oak Trail Shores	24
Sky Harbor	16
Indian Harbor	24
Walnut Creek	57
Long Creek	66
Strouds Creek	49
Rucker Creek	47
Robinson Creek	30

- Implementation strategies have been identified to achieve goals:
  - A watershed coordinator should oversee implementation of this WPP; the coordinator should be capable of identifying funding sources, summarizing monitoring, coordinating with local entities and assembling the stakeholders, as necessary

- Regional collection and treatment of wastewater is preferred by stakeholders over onsite systems for areas surrounding Lake Granbury and within Hood County
- Area-targeted educational programs should be pursued, including:
  - Septic maintenance, pets, greywater
  - Agricultural and small acreage land owners
    - Record-keeping for routine and scheduled maintenance activities for septic permit holders should be enforced
    - Home Owners Association (HOA) rules should require approval of health department prior to HOA approval of lot modifications (e.g., a larger septic system should be installed during construction of a larger house or addition to existing structures)
    - While measures to improve circulation within coves and canals may reduce bacteria concentrations and be beneficial to related water quality conditions, available funding sources should first target reduction of bacteria sources

The Lake Granbury WPP was developed to identify the issues facing the watershed and offer solutions and direction to decision-makers and to the Lake Granbury community for the future. Using information and strategies outlined in this WPP, the local community can work toward protecting and improving water quality in Lake Granbury. While the goal of the grant is to bring all parts of Lake Granbury up to attainment of State bacteria water quality standards, local stakeholders have developed their own goals for Lake Granbury that are more protective than the State standards. This plan will be a "living document" that can be updated and/or amended to meet future needs of the watershed and incorporate new data that the stakeholders determine necessary.