Report to Management

Audit of the Texas Natural Resources Information System

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Texas Water Development Board

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KEY POINTS OF INTEREST

Overall Conclusion

A review of the former TWDB Resource Information Office (RIO), which at the time included the Texas Natural Resource Information System (TNRIS), was conducted by a TWDB Management Review Team (MRT) in 2007. The report to the TWDB Executive Administrator entitled, "Review of Resource Information," was issued November 30, 2007, and is generally referred to as the "MRT Report." Areas of concern that were identified in the report have been addressed by the TNRIS management, including communication issues with TWDB and other agencies and programs. Based upon testing of contracts, the TNRIS contract management issues noted in the MRT Report have been addressed and corrected.

Although some procedures have been developed by TNRIS Team Leads, a formal, codified system governing written policies and procedures has not been developed. Software code documentation that exists via a software issue tracker should be further developed.

TNRIS' collection of physical data (maps, photographs, etc.), which is available for public use, is deteriorating and susceptible to damage.

The TNRIS developed software application entitled "GEMSS (Geospatial Emergency Management Support System)" was designed to store, modify, and disseminate data. It was developed in-house through grants from the U.S. Department of Homeland Security and Federal Emergency Management Agency. Since it is based on commercial software, it may require capitalization of costs.

Key Facts and Observations

To protect the program's deteriorating documents and photographs, TNRIS and TWDB should consider options for funding a digitization process.

Due to the recent issuance of Governmental Accounting Standards Board Statement No. 51 (GASB 51), TNRIS management should determine whether their version of GEMSS should be capitalized as an intangible asset.

TNRIS should continue to monitor access to AGORA (a web-based platform TNRIS utilizes for data collaboration) by outside users for potential breaches of security or unauthorized access to data.

A formal, codified system governing written policies, procedures, and software code documentation has not yet been implemented for the division.

Since the issuance of the MRT Report in 2007, TNRIS has improved its contract management and also its coordination and communication within TWDB and with other state and federal entities.

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A. Management Summary

1. Purpose

The purpose of this report is to present the conclusion, observations, recommended action plans, and management responses from an audit of the Texas Natural Resources Information System (TNRIS), a division within Water Resources Planning and Information. This audit was conducted in accordance with the *International Standards for the Professional Practice of Internal Auditing* and Generally Accepted Government Auditing Standards.

The government standards require the audit to be planned and performed to obtain sufficient, appropriate evidence to provide a reasonable basis for observations and conclusions based on the selected audit objectives. The evidence obtained provides a reasonable basis for the observations and conclusions based on these objectives.

2. Background

TNRIS was established by the Legislature in 1968 as the Texas Water-Oriented Data Bank. In 1972, after four years of growth and diversification, it was renamed the Texas Natural Resources Information System. The Texas Water Code, Section 16.021 describes the mission of TNRIS as a "centralized information system incorporating all Texas natural resource data, socioeconomic data related to natural resources, and indexes related to that data that are collected by state agencies or other entities."

TNRIS provides research materials and assistance in locating maps, reports, and information. The collection includes aerial photographs, topographic maps, wetlands maps, census maps and reports, and water resources records. Holdings include photographs from agencies such as the Texas Department of Transportation, U.S. Department of Agriculture-Soil Conservation Service, U.S. Geological Survey, National Aeronautics and Space Administration, and private aerial survey companies. These aerial photos span several decades and can be used for historical change analysis. The collection (over 600,000 photos) contains predominantly black and white prints. The photography archive is open to the public.

TNRIS also maintains a digital database of framework base map data for Texas. This online collection is available for no cost access to the public. The TNRIS data are accessed by a wide range of persons within Texas and around the world. TNRIS serves as the State’s principal geographic data clearinghouse and referral center serving state agencies and the public.

TNRIS is responsible for maintaining and developing these data through its Strategic Mapping program and through the Floodplain Mapping program. Developing and maintaining base data for the state allows government and the public to maintain accurate, reliable, authoritative and current information about the geography of Texas.

The TWDB receives advice on the operation of TNRIS from the Texas Geographic Information Council (TGIC), a geographic data planning and coordination group serving state and regional government agencies in the State of Texas.

TNRIS management is composed of a Director and the Team Leads from its four sections:

- Border Information Center
- Strategic Mapping
- Distribution Center and Information Services
- National Flood Insurance Program – Mapping Services

The TNRIS Director (Director) reports directly to the Deputy Executive Administrator (DEA) for Water Resources Planning & Information (WRPI). The Director is responsible for all information resource functions within the division as well as coordination of information services among TNRIS, TWDB, and other agencies.

Fieldwork, which was suspended at various times due to other audit priorities, was conducted from October 20, 2009 through February 28, 2010; and from April 15 through May 31, 2010. Fieldwork involved a review of selected documents and interviews with the WRPI DEA, the Director, and all nineteen (19) TNRIS staff (with the exception of one who was out on medical leave), including the Team Leads.

A review of the former TWDB Resource Information Office (RIO), which at the time included TNRIS, was conducted by a TWDB Management Review Team (MRT) in 2007. Their report to the TWDB Executive Administrator entitled, "Review of Resource Information," was issued November 30, 2007, and is generally referred to as the "MRT Report." The MRT Report noted that improvements were required in the area of contract management. In addition, the report recommended that TNRIS improve communications to ensure coordination and cooperation with Board members and within TWDB; and that TNRIS seek general revenue funding for all required staff.

3. Scope and Objectives

The scope of this audit encompassed the examination and evaluation of the adequacy and effectiveness of the internal controls and quality of performance in carrying out assigned responsibilities in relation to the financial monitoring process. The scope included specific program steps designed to assess:

- Safeguarding of assets
- Effectiveness and efficiency of operations, and
- Reliability and integrity of information.

The objectives included procedures designed to determine whether:

- TNRIS assets are secured, protected, and properly accessible,
- Written procedures exist and they adequately meet TNRIS' requirements,
- Communications are sufficient, and
- The process for soliciting, negotiating, and awarding contracts falls within the regulatory requirements.

4. Conclusion

Overall, areas of concern in the TNRIS division that were identified in the Management Review Team (MRT) Report in 2007 have been addressed by TNRIS management, including communication issues with TWDB and other agencies and programs. Based on testing of TNRIS contracts, the contract management issues noted in the MRT Report appear to have been addressed and corrected.

Although some procedures have been developed by TNRIS Team Leads, a formal, codified system governing written policies and procedures has not been developed. Software code documentation that exists via a software issue tracker should be further developed.

TNRIS' collection of physical data (maps, photographs, etc.), which is available for public use, is deteriorating and susceptible to damage.

The TNRIS developed software application entitled "GEMSS (Geospatial Emergency Management Support System)" was designed to store, modify, and disseminate data. It was developed in-house through grants from the U.S. Department of Homeland Security and Federal Emergency Management Agency. Since it is based on commercial software, it may require capitalization of costs.

5. Action Plans

The following steps are recommended:

- To protect the program's deteriorating documents and photographs, TNRIS and TWDB should consider options for funding a digitization process to protect them against further deterioration and/or destruction. Determining the cost of the digitization process should be the initial step. If funding is not available, then TNRIS and TWDB management should explore other options to maintain this resource.
- TNRIS management should consult with Finance management to determine whether GEMSS should be capitalized as an intangible asset and for assistance in capturing the costs related to developing this software application. To avoid potential copyright infringement, TNRIS should also make a determination regarding a need to change the GEMSS name.
- The development of internal procedures for TNRIS should be given a high priority. Uniform documentation of procedures, to include review and approval requirements and published location, will benefit all members of the team. Written documentation of software coding for all applications should be further developed. Establishing the parameters and directions

for software development can enhance control of the process, reduce communication difficulties, firmly establish timelines and milestones, and provide an established reference for employees and management.

- To enhance their abilities to perform their contracting duties, contract managers within TNRIS should attend and complete training for TWDB contract managers when it is offered.

B. Detailed Observations

1. TNRIS' Physical Collection of Data is a Valuable, but Deteriorating, Resource

TNRIS stores data both electronically and physically. The physical collection includes aerial photographs, topographic maps, wetlands maps, census maps and reports, and water resources records. Holdings include photographs from agencies such as the Texas Department of Transportation, U.S. Department of Agriculture-Soil Conservation Service, U.S. Geological Survey, National Aeronautics and Space Administration, and private aerial survey companies. A great majority of the collection is irreplaceable.

The risk for the physical collection is that the old photographs and maps are deteriorating and may become damaged or destroyed. The documents, maps, and photographs are stored throughout TNRIS, many in old file cabinets, which are not a good medium for the preservation of these documents.

An effort is being made to scan and digitize the physical collection. To this extent, TNRIS received a Coastal Impact Assessment Program (CIAP) grant from the Texas General Land Office. The grant funds a two-year program to scan as many photographs from coastal counties as possible.

Although funds from the CIAP grant help the digitization process; they are not sufficient to address all efforts required to fully safeguard the program's assets.

Recommended Action Plan 1: To protect the program's deteriorating documents and photographs, TNRIS and TWDB should consider options for funding a digitization process to protect them against further deterioration and/or destruction. Determining the cost of the digitization process should be the initial step. If funding is not available, then TNRIS and TWDB management should explore other options to maintain this resource.

Management Response 1: *Management agrees with this recommendation and will explore additional options for funding a digitization process while weighing other needs in TNRIS related to data collection and dissemination.*

Estimated completion date: *February 2011*

Responsible parties: *WRPI DEA, TNRIS Director, TNRIS Team Lead for Information Services and Research and Distribution.*

2. Internally-Developed Software Application GEMSS May Need to be Capitalized as an Intangible Asset

The most recent TNRIS developed software application was designed to store, modify, and disseminate data. The software is an internet based mapping system funded by federal grant sources. Entitled GEMSS (Geospatial Emergency Management Support System), the base version of this software was initiated December 2008. Since the software was developed in-house, it could be considered an "intangible asset." Therefore it may need to be capitalized based upon the recent issuance of Governmental Accounting Standards Board Statement No. 51 (GASB 51), which takes effect in 2010.

In addition, it was discovered during the audit that Environmental Resources Management, Inc. (ERM), Surfacewater Modeling Group, has already established a "Generalized Environmental Modeling System for Surfacewaters" (GEMSS®), which has been copyrighted. To avoid potential copyright infringement, TNRIS may have to consider a name change for GEMSS. Per the Director, this would not be an issue since a name change could be easily accomplished.

Recommended Action Plan 2: TNRIS management should consult with Finance management to determine whether GEMSS should be capitalized as an intangible asset and for assistance in capturing the costs related to developing this software application. To avoid potential copyright infringement, TNRIS should also make a determination regarding a need to change the GEMSS name.

Management Response 2*: Management understands that the agency's Chief Financial Officer (CFO) has been asked to investigate the need to include GEMSS as an intangible asset and will assist accordingly. Management will follow-up with the CFO on their findings. The TNRIS Director and Team Lead for Information Systems have met with TWDB's legal staff and were advised that GEMSS does not require a name change unless further copyright or other rights are sought by TNRIS. TNRIS does not plan to try to copyright the name GEMSS.*

Estimated completion date: *Intangible asset determination – January 2011*

Responsible party: *TNRIS Director*

3. Web-Based Platform AGORA Provides Reasonable Assurance of Access Security

Access security of the web-based platform (third-party software entitled "Confluence") TNRIS utilizes for data collaboration had not been independently reviewed prior to this audit. Confluence is an "Enterprise Wiki," which means it is a wiki used in a corporate (or organizational) context especially to enhance internal knowledge sharing. TNRIS labeled it "AGORA," which is from the ancient Greek for "a place of assembly."

Users outside of TNRIS have access to AGORA to participate in collaborative activities. Examples include sharing documentation for common projects, serving as a repository of data and findings, and a reference system of project contacts. Each external account is given access to a defined space within which other team

or project members share information. Collaborative spaces are accessed through authorized access controls that assign logins to individuals and limit their access to their assigned space unless otherwise provided by TNRIS administrators. Their level of access is determined by the Director and the Information Services Team Lead.

Utilizing a dummy or test profile, a brief access test provided reasonable assurance that the levels of access can be controlled, since areas that were available to a full access profile were restricted (unavailable) when using the test profile. While the testing described provided "reasonable assurance" that AGORA's security profiles provided adequate restrictions, it does not present the same level of assurance that would be provided by a full test of the security features.

Recommended Action Plan 3: None deemed necessary.

4. TNRIS Does Not Have A Formal, Codified System to Document Procedures

A standardized, codified system governing written policies, procedures, and software code documentation has not been implemented for the division. During the review, Internal Audit determined that some procedures were "in progress;" others were "in place" but not updated regularly; while still others appeared to be non-existent.

Software code documentation exists via TRAC software issue tracker but is not fully developed. TNRIS management indicated TRAC is being migrated to a system called JIRA, which is made by the company that licenses Confluence

All of the existing procedures resulted from individual efforts, usually by Team Leads, and were related to specific processes. Some procedures were maintained by the Team Leads. Other procedures were placed within the AGORA platform; however, they were not centrally located, nor did they employ standard formatting.

The lack of standardization makes it difficult to locate and utilize the procedures. The Director recognizes the necessity for maintaining a uniform system of policies and procedures.

Recommended Action Plan 4: The development of internal procedures for TNRIS should be given a high priority. Uniform documentation of procedures, to include review and approval requirements and published location, will benefit all members of the team. Written documentation of software coding for all applications should be further developed. Establishing the parameters and directions for software development can enhance control of the process, reduce communication difficulties, firmly establish timelines and milestones, and provide an established reference for employees and management.

Management Response 4: *TNRIS management agrees that there is an opportunity to create a more effective collection of processes to support both organization and agency goals.*

TNRIS operations and contracts include a wide variety of business practices and contracting types. These include point-of-sale-transactions, Library access contracts, local and state data projects, federal grants, workshop and training management, and federal state-wide data purchases. TNRIS has developed work process documentation for the majority of these operations and contracts but has not established an overall guide to serve as a resource for staff.

Implementation of an organization–wide system to manage the full spectrum of procedures will allow for greater understanding by personnel to monitor and maintain as needed. This will assist all staff to understand primary business processes and how to obtain current information to meet new project procedures and requirements.

Estimated completion date: *January 2011 for design and adoption of TNRIS Guide to Procedures; June 2011 to complete initial iteration of Guide documentation.*

Responsible parties: *TNRIS Director, Team Leads, and responsible staff.*

5. TNRIS Has Improved its Coordination and Communication within TWDB and with Other State and Federal Entities

The MRT Report recommended that TNRIS improve communications to ensure coordination and cooperation with the Board, within TWDB, and with other state and federal entities.

In response to the MRT Report's communications findings, TNRIS has improved its coordination and communication within TWDB, and with other entities.

According to the Director, at the time of the 2007 MRT Report, TNRIS was not fully integrated into TWDB, was not aligned with WRPI, and was deficient in its formal reporting structure. However, the subsequent alignment of TNRIS within WRPI has strengthened its communication and coordination with the other areas of TWDB, and has the support of the TWDB Executive Administrator and the WRPI Deputy Executive Administrator.

Recent projects indicate increased communication and coordination with other agencies. Examples are:

- Utilizing the internally-developed GEMSS as a platform, TNRIS worked with the Environmental Protection Agency, Corps of Engineers, Texas Commission on Environmental Quality, and Texas Parks and Wildlife Department to build a system to collect scientific data on water quality across the state.

- The High Priority Imagery and Data Set (HIPIDS) is a multi-agency, high-dollar endeavor that strengthened TNRIS. TNRIS is the repository of geospatial data and has a responsibility to administer it. Through a state requirement that all state agencies coordinate geographic information systems data with TNRIS, HIPIDS has increased efficiencies and reduced duplication of processes.

Recommended Action Plan 5: None deemed necessary.

6. Contract Management Has Improved within TNRIS since MRT Report was Issued

The 2007 MRT Report stated the following regarding TNRIS contract management:

> "Many areas of inadequate or, in some cases, inappropriate contract management were identified by the MRT….One of the most compelling issues identified…was the absence of any tool, process, or systematic review of deliverables, milestones, billings, staff resources, etc., associated with the contracts."

In general, it appears that the contracting area has improved within TNRIS since the MRT Report was issued. There are two areas of concern: A lack of codified written contracting procedures (addressed in Observation 4 above) and inadequate preparation of Team Leads for contract responsibilities.

In order to review the contract process, four contracts were selected for testing from a total of twenty-nine (29) active contracts from the "TNRIS Active Contracts List." The list provided by TNRIS was matched to the TNRIS contracts listed within the Contract Administration System (CAS) to ensure all contracts were properly captured. No major discrepancies were noted.

A sample of payments/invoices was selected from each of the four contracts listed above and tested to ensure payments/receivables were properly authorized, processed, paid/deposited, and recorded. No discrepancies were noted.

A review of a recent aged receivables report revealed that for the entire agency only $7,085 out of a total $575,648 (1.2%) in receivables exceeded 30 days past due. The two contracts that had outstanding receivables belonged to TNRIS. However, Finance staff verified that both contractors are on payment plans to recoup past unbilled receivables.

While no major discrepancies were evident in the tested payments and receipts, there were some issues with the process. Interviews with new Team Leads revealed they were not adequately prepared for the contracting process. At least two Team Leads stated they had to learn the contract process on their own. They did indicate, however, that TNRIS management and Contract and Purchasing staff were very helpful and assisted them with their questions and problems.

Recommended Action Plan 6: To enhance their abilities to perform their contracting duties, contract managers within TNRIS should attend and complete training for TWDB contract managers when it is offered.

Management Response 6: *TNRIS contract managers and other staff have continued to pursue enhancement to their knowledge by completing project management courses.*

Aligning these skills with State contract management practices is seen as the next step in strengthening the organization's ability to ensure quality and accuracy.

TNRIS has been advised of the contract training offered through the Comptroller of Public Accounts and will pursue as courses and funding are available

Estimated completion date: *On-going as appropriate, depending upon class offerings and funding availability.*

Responsible parties: *TNRIS Director, Team Leads, and contract managers.*

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