



Lavois Campbell, CIA, CISA, CFE, CGA  
Interim Chief Audit Executive

**September 2022**

**DeKalb County Government**

**ORACLE**

**INFORMATION TECHNOLOGY  
GENERAL CONTROLS AUDIT**

**FINAL REPORT**

**O.C.G.A. § 50-18-72(a)(25)(A)**

### **REDACTION NOTICE**

Sections of this audit report have been redacted to protect information, "which if made public could compromise security against sabotage, criminal or terroristic acts." **O.C.G.A. § 50-18-72(25)(A).**



Lavois Campbell  
Interim Chief Audit Executive

ORACLE INFORMATION TECHNOLOGY GENERAL  
CONTROLS AUDIT  
AUDIT REPORT NO. IA-2020-005-IT

FINAL

HIGHLIGHT SUMMARY

**Why We Performed the Audit**

In accordance with the Office of Independent Internal Audit (OIIA) Annual Audit Plan, we conducted a performance audit of the Information Technology General Control (ITGC) processes within the County's Oracle Solution (Oracle). The objectives of the audit were to assess the adequacy of the information technology general controls within the Oracle solution in the Department of Innovation and Technology. We assessed whether the controls were sufficient to support the County's financial business processes and reporting.

**How We Performed the Audit**

The audit focused on the ITGCs related to Oracle solution from January 1, 2019, through the present. Our methodology included, but was not limited to, the following:

- Reviewed relevant policies, procedures, and standards.
- Examined supporting documentation to assess the effectiveness of controls in place.
- Interviewed appropriate County personnel and consultants.
- Conducted walkthrough of processes within the Oracle solution.
- Tested and evaluated the operating effectiveness of ITGC within the Oracle solution.

**Background**

DeKalb County utilizes the enterprise-wide Oracle solution to support essential County processes, including to capture, accept, record, analyze, process, and report on the County's financial transactions and information related to the County's \$1.2 billion budget. Oracle also supports the management of millions in grants and assets and personnel records. The County has deployed 32 modules of the Oracle with 650 enterprise-wide active users' licenses across all departments.

The integrity, accuracy, and completeness of information, protection of sensitive data, and effectiveness of County processes supported by Oracle are critical to successful County operations. Information Technology General Controls is the set of policies and controls that guide the County's use of the Oracle and protect the data it stores and processes. These controls provide the foundation for compliance, effective operations, and reliable reporting. Simply put, without effective ITGCs, users cannot rely on the data and reports that IT systems provide.

The County implemented Oracle in 2004 and it was last upgraded to the current version [redacted] while the database runs on the [redacted] version. Plans are in progress/planned for migrating the local hardware infrastructure to vendor-provided remote cloud infrastructure in 2022. Oracle is managed and supported by the Enterprise Resource Planning Solution team, Department of Innovation and Technology (DoIT).

**What We Found**

The audit noted that the custodians of Oracle, Department of Innovation and Technology (DoIT), have effective controls in place to help ensure effective application change management. Additionally, we noted that management had policies and procedures in place to help manage the backup processes including performing daily incremental and weekly full backups of Oracle transactional data.



**Audit Results Summary**

Audit Results Summary	
1.	[redacted] [red]
2.	[redacted] [red]
3.	[redacted] [red]
4.	[redacted] [red]
5.	[redacted] [red]
6.	[redacted] [yellow]
7.	[redacted] [yellow]
8.	[redacted] [red]
9.	[redacted] [yellow]
10.	[redacted] [yellow]

■ No exceptions were noted.  
■ Exception- Internal control improvements are needed.  
■ Exception - internal control deficiencies/gaps noted.

**What we Recommend**

We recommend that the management of DoIT collaborate with the Purchasing & Contracting and Finance Departments to address the internal control deficiencies and recommended process improvements identified in this report.

**How Management Responded:** Management agrees with the exceptions noted.



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**BACKGROUND AND INTRODUCTION**

DeKalb County utilizes the enterprise-wide Oracle solution (Oracle) to support essential County processes, including capturing, accepting, recording, analyzing, and reporting on the County’s financial transactions and information related to the County’s \$1.2 billion budget, assets, and personnel records. The County has deployed 32 modules of Oracle with 650 enterprise-wide active users’ licenses across all departments. Figure 1 below highlights some of the essential County processes that are supported by Oracle:

**Figure 1:** Oracle modules implemented in the County



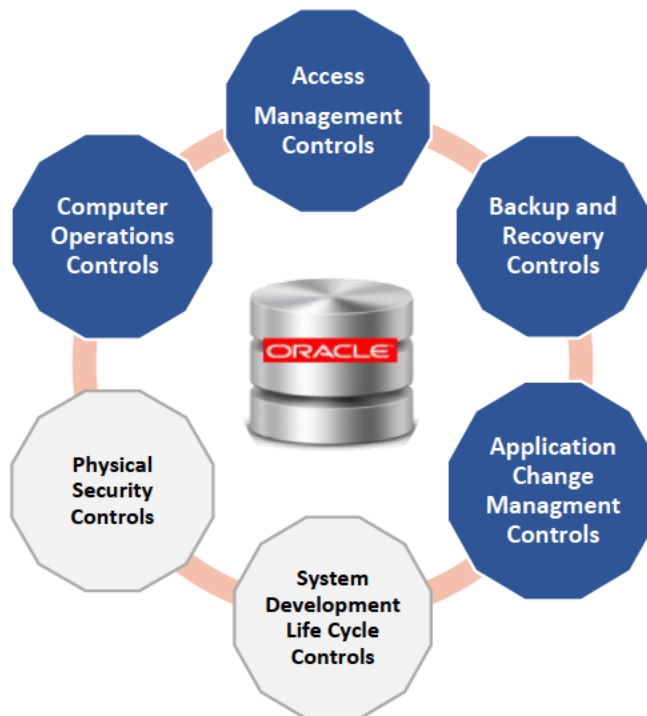
Source: OIIA process walkthroughs



The integrity, accuracy, and completeness of information, protection of sensitive data, and the effectiveness of County processes supported by Oracle are critical to successful County operations. Oracle Information Technology General Controls (ITGCs) is the set of policies and controls that guide the County's use of Oracle and protect the data it stores and processes. These controls provide the foundation for compliance, effective operations, and reliable reporting. Simply put, without effective ITGCs, users cannot rely on the data and reports that IT systems provide.

These ITGCs include:

**Figure 2: ITGC key components**



*Source: OIIA process walkthroughs*

This audit focused on the following ITGC components:

**Logical access controls** - The policies, procedures, organizational structure, and electronic access controls that are designed to restrict access to computer software and data files.

**Application change management controls** - The process that management uses to identify, document, and authorize changes to an Oracle IT environment.

**System and data backup and recovery controls** - Backup and recovery describes the process of creating and storing copies of software and data that can be used to protect organizations against data loss and system downtime.

**Computer operation controls** - Computer operation controls consist of various subcategories of controls that relate to the operation of IT systems. These controls check whether IT systems continue to operate as expected, such as audit log management.



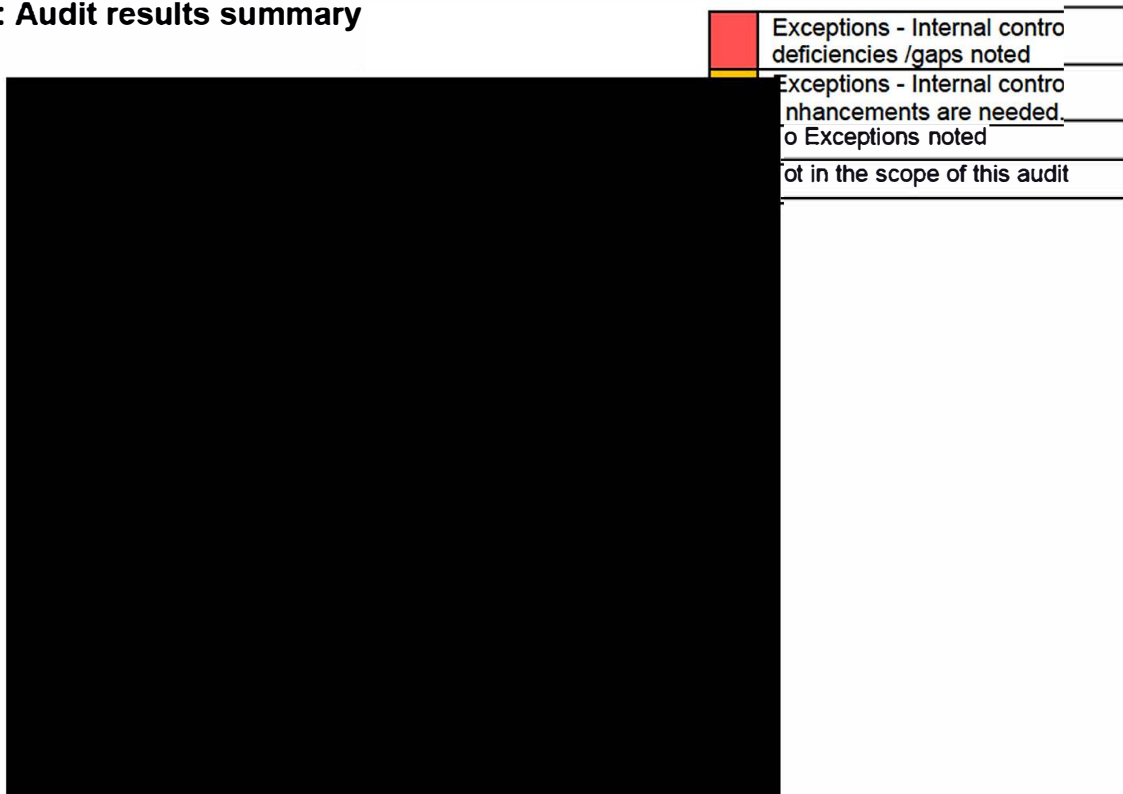
The other two ITGC components were excluded from the scope of this audit as the Office of Independent Internal Audit (OIIA) recently conducted an audit of the data center's physical security controls, and the County's Department of Innovation and Technology (DoIT) is not significantly involved in application development life cycle controls.

The County implemented Oracle in 2004 and it was last upgraded to the current version [REDACTED] in 2014, while the database upgraded from [REDACTED] version. The County's Oracle solution is managed and supported by DoIT's Enterprise Resource Planning Solution team.

**AUDIT RESULTS**

The audit noted that the custodians of Oracle, the DoIT, [REDACTED] [REDACTED] Figure 3 below highlights the ITGC components that should be strengthened. The detailed findings and recommendations are provided in this report.

**Figure 3: Audit results summary**



Source: OIIA process walkthroughs



[Redacted text block]

[Redacted text block]

**FINDING 1:** [Redacted]

[Redacted text block]

- [Redacted list item]
- [Redacted list item]

**Recommendation:**

[Redacted text block]





[REDACTED]

**Management Response (DoIT):**

Management Agreement	Description of Management's Action Plan to Address Finding	Estimated Timeline to implement Action Plan
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[REDACTED]	[REDACTED]
<i>Reason For Disagreement:</i>		

**FINDING 2:** [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**Recommendation:**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**Management Response (DoIT):**

Management Agreement	Description of Management's Action Plan to Address Finding	Estimated Timeline to implement Action Plan
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[REDACTED]	[REDACTED]
<i>Reason For Disagreement:</i>		



**FINDING 3:** [REDACTED]  
 [REDACTED]

[REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]

**Recommendation:**

[REDACTED]  
 [REDACTED]  
 [REDACTED]

**Management Response (DoIT Management):**

Management Agreement	Description of Management's Action Plan to Address Finding	Estimated Timeline to implement Action Plan
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED]
<p><i>Reason For Disagreement:</i></p>		

**FINDING 4:** [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]



**Recommendation:**

[REDACTED]

**Management Response (DoIT Management):**

<i>Management Agreement</i>	<i>Description of Management's Action Plan to Address Finding</i>	<i>Estimated Timeline to implement Action Plan</i>
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[REDACTED]	[REDACTED]
<i>Reason For Disagreement:</i>		

**FINDING 5:**

[REDACTED]

- [REDACTED]
- [REDACTED]

**Recommendation:**

[REDACTED]

- [REDACTED]
- [REDACTED]



**Management Response (DoIT Management):**

<i>Management Agreement</i>	<i>Description of Management's Action Plan to Address Finding</i>	<i>Estimated Timeline to implement Action Plan</i>
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[REDACTED]	[REDACTED]
<i>Reason For Disagreement:</i>		

**FINDING 6:** [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]  
 [REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]
- [REDACTED]

**Recommendation:**

[REDACTED]

- [REDACTED]
- [REDACTED]



- [Redacted]

**Management Response (DoIT):**

<i>Management Agreement</i>	<i>Description of Management's Action Plan to Address Finding</i>	<i>Estimated Timeline to implement Action Plan</i>
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[Redacted]	[Redacted]
<i>Reason For Disagreement:</i>		

**FINDING 7:** [Redacted]  
 [Redacted]  
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**Recommendation:**  
 [Redacted]  
 [Redacted]  
 [Redacted]  
 [Redacted]  
 [Redacted]



[REDACTED]

**Management Response (DoIT):**

Management Agreement	Description of Management's Action Plan to Address Finding	Estimated Timeline to implement Action Plan
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[REDACTED]	[REDACTED]
<i>Reason For Disagreement:</i>		

**FINDING 8:** [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

- [REDACTED]
- [REDACTED]
- [REDACTED]

**Recommendation:**

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**Management Response (DoIT Management):**

Management Agreement	Description of Management's Action Plan to Address Finding	Estimated Timeline to implement Action Plan
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[REDACTED]	[REDACTED]



	[REDACTED]	
<i>Reason For Disagreement:</i>		



[REDACTED]

**FINDING 9:** [REDACTED]

[REDACTED]

**Recommendation:**

[REDACTED]



- █ [Redacted]
- █ [Redacted]
- █ [Redacted]

**Management Response (DoIT Management):**

<i>Management Agreement</i>	<i>Description of Management's Action Plan to Address Finding</i>	<i>Estimated Timeline to implement Action Plan</i>
<input checked="" type="checkbox"/> Agree <input type="checkbox"/> Disagree	[Redacted]	[Redacted]
<i>Reason For Disagreement:</i>		



[Redacted]

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**FINDING 10:** [Redacted]

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**Recommendation:**

[REDACTED]

[REDACTED]

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[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

**Management Response (DoIT):**

<i>Management Agreement</i>	<i>Description of Management's Action Plan to Address Finding</i>	<i>Estimated Timeline to implement Action Plan</i>
<input checked="" type="checkbox"/> Partially Agree <input type="checkbox"/> Disagree	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]	[REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED] [REDACTED]
<b>Reason For Disagreement:</b>		



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## APPENDICES

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### Appendix I – Purpose, Scope, and Methodology

#### Purpose

The purpose of the audit was to assess the design and effectiveness of the information technology general controls of the County's Oracle solution. The audit objectives were to:

- Determine whether user access in Oracle is appropriate based on employees' job responsibilities.
- Determine whether appropriate password controls have been implemented.
- Determine the effectiveness of the change management process implemented by the DoIT around Oracle that supports business processes.
- Determine whether audit logs and control procedures are in place to monitor user activities for appropriateness.
- Determine DoIT's current backup and recovery procedures and evaluate these procedures for compliance with IT standards.

#### Scope and Methodology:

The scope of our audit focused on the performance of Information Technology General Controls (ITGC) around Oracle from January 1, 2019, through the present.

Our methodology included using the guidance outlined in the National Institute of Standards and Technology (NIST) Special Publication 800-53 (Security and Privacy Controls for Information Systems and Organizations). We also used the following strategies stated below:

- Reviewed relevant policies, procedures, and standards.
- Examined supporting documentation to assess the effectiveness of controls in place.
- Researched related best practices.
- Interviewed key stakeholders in the business areas and the Department of Innovation and Technology.
- Performed tests and evaluated the operating effectiveness of key ITGC.



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## Appendix II – Management Response

OFFICE OF CIO & DIRECTOR  
JOHN A. MATELSKI



September 2, 2022

Lavois Campbell  
Interim Chief Audit Executive  
Office of Independent Internal Audit  
1300 Commerce Drive, Suite 300  
Decatur, Georgia 30030

RE: **Management Response to “Oracle Information Technology General Controls”  
Audit Report**

Dear Mr. Campbell:

In accordance with DeKalb County, Georgia – Code of Ordinances / Organizational Act Section 10A- Independent Internal Audit, this is our response to the audit named above provided in this document. As required by the ordinance, our response includes 1) a statement regarding our agreement or disagreement along with reasons for any disagreement, 2) our plans for implementing solutions to issues identified, and 3) the timetable to complete such plans.

If you have any questions about this response, please contact John Matelski, CIO Department of Innovation & Technology (DoIT).

Sincerely,

John Matelski, Chief Information Officer, Department of Innovation & Technology



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## Appendix III – Definitions and Abbreviations

### Acronyms and Abbreviation

**OIIA:** Office of Independent Internal Audit

**DoIT:** Department of Innovation and Technology

**ITGC:** Information Technology General Controls

**COSO:** Committee of Sponsoring Organizations of the Treadway Commission

**NIST:** National Institute of Standards and Technology

**INV:** Inventory

### Key Definitions

**Oracle Solution:** This is the mix of the application, database, and operating systems that the Oracle software runs on. [REDACTED]

**Oracle E-Business Suite:** This is the Enterprise Resource planning solution used by the County for processing its core business transactions such as Financials (Payables, Receivables, Cash Management, General Ledger, Grants Accounting, Payments, Inventory) Projects, and Procurement.

**Authentication:** Verifying the identity of a user, process, or device, often as a prerequisite to allowing access to resources in a system.

**Authorization:** Access privileges granted to a user, program, or process or the act of granting those privileges.

**Logical Access Control System:** An automated system that controls an individual's ability to access one or more computer system resources, such as a workstation, network, application, or database. A logical access control system requires the validation of an individual's identity through some mechanism, such as a PIN, card, biometric, or other tokens. It can assign different access privileges to different individuals depending on their roles and responsibilities in an organization.

**Privileged User/Account:** A user that is authorized (and therefore, trusted) to perform security-relevant functions that ordinary users are not authorized to perform.

**Security Control:** The safeguards or countermeasures prescribed for an information system or an organization to protect the confidentiality, integrity, and availability of the system and its information.

**Recovery Point Objective:** The point in time to which data must be recovered after an outage.

**Recovery Time Objective:** The maximum amount of time that a system resource can remain unavailable before there is an unacceptable impact on other system resources, supported mission/business processes, and the maximum tolerable downtime.



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## DISTRIBUTION

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### Action Official Distribution:

John Matelski, Chief Information Officer  
Dianne McNabb, Chief Financial Officer  
Michelle Butler, Chief Procurement Officer

### Statutory Distribution:

Michael L. Thurmond, Chief Executive Officer  
Zachary L. Williams, Chief Operating Officer/ Executive Assistant  
Robert Patrick, Board of Commissioners District 1  
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Larry Johnson, Board of Commissioners District 3  
Steve Bradshaw, Board of Commissioners District 4  
Mereda Davis Johnson, Board of Commissioners District 5  
Ted Terry, Board of Commissioners District 6  
Lorraine Cochran-Johnson, Board of Commissioners District 7  
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Harold Smith, Jr., Vice-Chairperson, Audit Oversight Committee  
Gloria Gray, Audit Oversight Committee  
Lisa Earls - Chair, Audit Oversight Committee  
Tanja Christine Boyd-Witherspoon, Audit Oversight Committee  
Vivian Ernstes, County Attorney  
La'Keitha D. Carlos, CEO's Chief of Staff  
Kwasi K. Obeng, Chief of Staff, Board of Commissioners

### Information Distribution:

Zachary L. Williams, Chief Operating Officer/ Executive Assistant  
Vivian Ernstes, County Attorney  
La'Keitha D. Carlos, CEO's Chief of Staff  
Kwasi K. Obeng, Chief of Staff, Board of Commissioners  
LaTonya Wiley, Deputy Ethics Officer, DeKalb Board of Ethics



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## PROJECT TEAM

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**This report was submitted by:**

*Rubby A. Ibe-Ikechi*

Rubby A. Ibe-Ikechi, CISA, ISO/IEC 27001 LA  
IT Audit Manager,  
Office of Independent Internal Audit

09.09.2022

Date

**This report was reviewed and approved by:**

*Lavois M. Campbell*

Lavois Campbell, CISA, CIA, CFE, CGA-CPA  
Chief Audit Executive (Interim)  
Office of Independent Internal Audit

09.09.2022

Date



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## STATEMENT OF ACCORDANCE

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### Statement of Accordance

*The mission of DeKalb County is to make the priorities of the citizens of DeKalb County; the priorities of County government - by achieving a safer DeKalb, building stronger neighborhoods, creating a fiscally accountable and more efficient county government, and uniting the citizens of DeKalb County.*

*The mission of the Office of Independent Internal Audit is to provide independent, objective, insightful, nonpartisan assessment of the stewardship or performance of policies, programs, and operations in promoting efficiency, effectiveness, and integrity in DeKalb County.*

*This performance audit was prepared pursuant to DeKalb County, Georgia – Code Ordinances/Organizational Act Section 10A- Independent Internal Audit. We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.*

*This report is intended for the use of the agency to which it was disseminated and may contain information that is exempt from disclosure under applicable law. Do not release without prior coordination with the Office of Independent Internal Audit.*

*Please address inquiries regarding this report to the Office of Independent Internal Audit at 404-371-2765.*