

EPEAT Application Project Technical Proposal

Proposal Submitted for:

EPEAT



Proposal Submitted by:



With the support of



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1.0 Proposal Background

The EPEAT Implementation Team is accepting proposals from qualified vendors to provide for the design, development, implementation and maintenance of a web-based EPEAT application.

EPEAT is a multi-stakeholder process to design and implement a tool for evaluating the environmental performance of electronic products. After development of the initial set of EPEAT program requirements, the EPEAT tool is being implemented by an Implementation Team of expert stakeholders. Their mission is to finalize development and implement an assessment tool for use during the procurement of electronic products and services. The EPEAT tool is intended to:

- Promote continuous improvement in the environmental performance without stifling, and while encouraging, innovation;
- Address the lifecycle of electronic products including, but not limited to, design, procurement, use, and end-of-life implications;
- Inform purchasing decisions by institutional purchasers regarding the environmental attributes of electronic products;
- Provides market advantage for companies that provide products and services that achieve improved environmental performance;
- Is low cost, user friendly, and causes minimal delay in time to market;
- Produces credible, verifiable outcomes that are accepted by relevant stakeholders and
- Provides sufficient value in the marketplace to sustain itself.

The management of electronic equipment at the end-of-life (EOL) is becoming a problem of increasing urgency. Developing solutions to this challenge is being addressed through multi-stakeholder dialogues, whose goal is to create a shared responsibility framework to greatly expand the reuse and recycling of discarded electronic devices.

One of the dialogues, the Western Electronic Product Stewardship Initiative (WEPSI), proposed that methods be explored to provide a marketplace reward for product designs that embody superior environmental attributes. Product design makes a great difference in the cost efficiency and environmental effectiveness of EOL management. Some products retain substantial value at EOL, while others can be costly to manage.

Public agencies are concerned about the total cost of ownership of their purchases, and they benefit from lower EOL costs. These agencies, through their purchasing, can send a strong market signal. But purchasing officials need a clear and easy-to-use method to evaluate products. Recognizing the maxim that “what gets measured, gets managed”, the focus of this project is to develop an assessment tool that will advise procurement officials regarding the environmental attributes of personal computing devices.

Overall EPEAT Project Goals

In short, the goal of the EPEAT development project is to develop an assessment tool that:

- Is simple and clear to a purchasing agent,
- Is voluntary but inviting for manufacturers,
- Is transparent and flexible to a product designer, and rewards innovation,
- Is low cost and causes no delay in time-to-market,
- Addresses the significant EOL issues faced by the reuse and recycling community, and
- Effectively measures preferred environmental design.

The EPEAT project has successfully called on dedicated stakeholders to help examine and come to consensus on potential assessment methods. The EPEAT Implementation team is now identifying the appropriate organizational structures to implement and operate an assessment tool, and is producing a plan for development and funding.

Background on MARCEE and DN American

Resources for initial development of the EPEAT web-based application by DN American are available from the Mid-Atlantic Recycling Center for End-of-Life Electronics (MARCEE) project. Background on MARCEE and DN American is provided below.

MARCEE is a joint effort between the U.S. Department of Energy and the U.S. EPA to find solutions in order to get recycled materials from electronics back into new products. This project has a specific emphasis on finding solutions for the plastics generated from end-of-life electronics. As part of this effort an information technology infrastructure was created to help share information, collaborate ideas, collect data, and provide supply chain support technologies for the electronics recycling industry. The MARCEE project selected DN American as their information technology partner. The current funding year for MARCEE began October 1, 2004 and ends on September 30, 2005.

DN American is a West Virginia-based small, disadvantaged business with headquarters in Fairmont, WV. Since its inception in 1989, the company has continuously leveraged its experience and performance record to grow into a provider of comprehensive Information Technology (IT) services for the federal government. Subsequently, the company has a proven track record with customers such as the NASA IV&V Facility, Department of Energy (DOE), Corps of Engineers (COE), Federal Bureau of Investigation (FBI), and Department of Defense (DOD). Today the company employs more than 150 professionals in five (5) core business lines: Technology & Management Services, Enterprise Business Solutions, Advanced Computing Services, Homeland Security & Systems Engineering, and Data Management Services.

As a company, DN American brings additional business attributes that will ensure performance and development of the EPEAT Project. These attributes include:

- DN American has been involved with the electronics recycling industry since 1999
- DN American has an employee base of over 100 professionals who can be called upon to support technical expertise
- Over the past four (4) years, the company has significantly exceeded industry retention rates, with employee retention rates of 91% company-wide
- Over the past five years, DN American has rapidly deployed web-based applications in support of MARCEE initiatives ranging from data collection to electronic marketplace support

- Software Engineering
- Systems Engineering
- Computer Operations Support
- Cyber Security
- Application Development
- Information Architecture Development
- Internet and Web Technologies
- Software Reuse Technologies
- Clustering Technologies
- Collaborative Tools Development
- Genetic Algorithms
- Code Conversion
- Program and Facility Management Tools
- Help Desk Management
- Systems Administration
- Network Management
- Cable Plant Management
- Scanning and Data Conversion Services
- Data Entry and Validation Services

Figure 1 – DN American IT Core Competencies

- The company is focused around the five (5) core business lines that provide a wealth of knowledge and experience in a broad spectrum of technology development, quality assurance, and technology management

DN American is a company driven by core values and practices that promulgate a business culture based on performance, innovation, and teamwork. These values and practices help build trusted relationships with our customers.

2.0 Business Proposal

All costs to execute the technical approach detailed in Section 4 are shown in Section 6 - Software Development Hours/Costs. Should this proposal be accepted by the EPEAT Implementation Team, DN American will use MARCEE funds made available for this purpose consistent with the budget in 7.0 (MARCEE funding comes through NETL/WVU Cooperative Agreement DE-FC26-04NT42136).

Although DN American will work to finalize all development activities by that date, the final “go-live” date for this application is not expected until January, 2006 (see Schedule, section 5). For any costs to be incurred after this date DN American will work with the EPEAT Web Steering Committee and the Implementation Team to identify sources of funding – including the possibility of additional funding from next year’s MARCEE program – to complete the application development process. Should no additional sources of funding be identified and secured by August 30, 2005, DN American will so notify the EPEAT Web Steering Committee to finalize plans for wrapping up development activity by September 30, 2005 that may deviate from the final phases of the technical approach described in Section 4.

As the developer of this application, in conformance with the Intellectual Property requirements established for the MARCEE grant by the Department of Energy, concurrently with delivery of the source code DN American will offer the host organization a perpetual, royalty free, worldwide license for use of this application.

DN American and the MARCEE project ask that special consideration be given to DN American/MARCEE as ongoing technical support to the EPEAT web-based application. Specifically, we ask that such consideration be included as part of the host organization selection process. At a minimum, we request that the EPEAT Implementation Team encourage potential host organizations to continue use of the technical support team utilized in developing the initial EPEAT web-based application.

3.0 Past Performance

DN American’s business base is primarily focused in five (5) business lines:

- Technology & Management Services
- Enterprise Business Solutions
- Advanced Computing Services
- Homeland Security & Systems Engineering

- Data Management Services.

As Figure 1 – DN American IT Core Competencies illustrates, DN American has developed an extensive capability and experience base through these five (5) core competencies during the past fourteen (14) years.

The following sections of this document describe DN American’s current IT services that best resembles the services required by EPEAT with respect to work size and scope. Table 1 – DN American IT Experience Relative to EPEAT Effort illustrates the equivalent experiences required by the EPEAT effort performed by DN American on similar contract efforts.

Table 1 – DN American IT Experience Relative to EPEAT Effort			
IT Services required by EPEAT	WVU/NETL (MARCEE)	Polymer Alliance Zone (PAZ)	EPA Region III eCycling Program
Web-Based Application Development	X	X	X
Database Design and Development	X	X	X
Software Testing	X	X	X
Development of System Documentation	X	X	X
Software Design	X	X	X
Software Development	X	X	X
Software Maintenance	X	X	X
Microsoft Platform Development	X	X	X
Microsoft SQL Server	X	X	X
Program Management	X	X	X

3.1 West Virginia University Research Corporation/National Energy Technology Laboratory (NETL) – (MARCEE Project)

3.1.1 Electronics Recycling Informational Web Portal

DN American has been working on a multi-year project with WVU in regards to the Mid-Atlantic Recycling Center for End-of-life Electronics (MARCEE). One of the information technology tools developed and still maintained by DN American is the Electronics Recycling portal (<http://www.electronicrecycling.com>). This information repository includes a backend Microsoft SQL Server that feeds a Web-Based front-end application for information exchange. The unique aspect of this site is that all of the pages are generated dynamically, which includes access to over 350 content items.



The site also maintains an organizational / contact database that currently has over 700 entries listed. The site is developed based upon the Microsoft .NET framework and also incorporates the use of XML and XML-based web services.

3.1.2 EPA Region III Recycling Data Collection System

DN American in support of the MARCEE project has also developed a Web-based Database System to support the data collection efforts of the EPA Region III Recycling program. This Microsoft SQL Server backed application provides users online access to several data collection forms and also provides a dynamic reporting capability for real-time data analysis. This application currently houses pilot project collection data for over 45 programs within a 5 state geographic region. This site is built utilizing a Microsoft IIS server and a Microsoft SQL Server running Analysis Services. The Analysis Services component allows us to develop Online Analytical Processing of data cubes, which allows us to provide some robust business intelligence tools for data analysis. The application can be found at: <http://www.electronicrecycling.com/ecycling>



3.2 *Polymer Alliance Zone of West Virginia (PAZ) – 501(c)3 public/private partnership for economic development in West Virginia*

3.2.1 Polymer Alliance Zone Website

DN American has worked with the Polymer Alliance Zone in order to create a dynamic website to help portray the objectives of the PAZ. This website utilizes Microsoft SQL Server to maintain an organizational database of all member information. The site also utilizes a Web-Based Content Management System to provide a simple, easy to use management tool for maintaining content information or database entries. This site was developed utilizing the Microsoft ASP.NET language and Microsoft Visual Studio suite of tools. The site can be reached at: <http://www.pazwv.org>.



3.2.2 GreenOnline.Com Environmental Marketplace

The Polymer Alliance Zone also owns the GreenOnline.com system for Environmental services. DN American provides all technical services in site maintenance and database management. This site was originally built utilizing Microsoft ASP components and has recently migrated to the Microsoft ASP.NET architecture to enable the more efficient use of XML-based web services. This site maintains a series of electronic marketplaces that are branded individually as <http://www.plasticsreuse.com>, <http://www.metalsreuse.com>, and <http://www.glassreuse.com>. The GreenOnline site can be accessed via <http://www.greenonline.com>. The electronic marketplaces are all built utilizing a Microsoft SQL Server as their backend data repository.



Table 2 – DN American’s Advantages in Supporting the EPEAT Project

DN American Discriminators	Competitive Advantage	Benefit to the EPEAT Project
<p>Familiarity with the MARCEE project and the electronics recycling industry.</p>	<p>Over five (5) years of contracting experience working with MARCEE project</p>	<p>Familiarity with MARCEE Industry initiatives:</p> <ul style="list-style-type: none"> ▪ Existing working relationship with EPA Region III and National Plug-in to Recycling program ▪ Existing working relationship with MARCEE Implementation manager – Walter Alcorn
	<p>Attended several national/international conferences relating to electronics recycling</p>	<p>Knowledge of End-of-Life Electronics issues:</p> <ul style="list-style-type: none"> ▪ Information Sharing ▪ Data Collaboration
<p>Familiarity with the Web-Based Database Projects</p>	<p>DN American has developed numerous Internet/Intranet solutions for Government & Commercial clients.</p>	<p>Web-Based Application Development includes solution for:</p> <ul style="list-style-type: none"> ▪ Corporate Internet/Intranet ▪ Dynamic Purchase Request Systems ▪ Web-Enabled Database & Data Collection Systems <p>This technical knowledge ensures a high level of domain expertise as it relates to web-enabled applications.</p>
	<p>Extensive experience with the development of web site and database architecture</p>	<p>Implementation of web site and Database Solutions include projects with:</p> <ul style="list-style-type: none"> ▪ Department of Energy ▪ NASA ▪ Software Productivity Consortium <p>This expertise ensures a broad level of technical knowledge enabling high performance and customer satisfaction.</p>
<p>Strong Database and Microsoft SQL Experience</p>	<p>DN American is a Registered Microsoft Partner.</p>	<p>This Microsoft Partner status ensures that DN American is on the cutting-edge of technology as it relates to Microsoft Solutions.</p> <ul style="list-style-type: none"> ▪ DN American maintains a Microsoft Action Pack Subscription, which provides technical insight in some instances even before it is released to the public. ▪ DN American has full access to Microsoft Software and Applications for development and testing purposes.

Table 2 – DN American’s Advantages in Supporting the EPEAT Project		
DN American Discriminators	Competitive Advantage	Benefit to the EPEAT Project
	DN American has deployed and currently maintains numerous Microsoft SQL Server installations in both development and production level modes.	This technical expertise allows DN American to respond rapidly to any database changes that might impact performance, security, or maintainability. <ul style="list-style-type: none"> ▪ DN American has experience in database design and database management to help provide a seamless transition to the EPEAT environment. ▪ DN American has successfully completed projects that have thousands of data elements into a robust data warehousing solution. This knowledge will help EPEAT identify potential scalability issues during database design phase.
Established Software Development Practices	Enterprise Business Solutions Program Management Experience – Mr. Jeffrey Tucker	Mr. Tucker has led numerous web-based application projects over the past 8 years. He currently has over 13 years experience in the field of information technology. <ul style="list-style-type: none"> ▪ Currently serves as Software Process Improvement Coordinator ▪ Maintains a strong technical background especially in the area of Rapid or Joint Application Development Projects.
	Established Software Development Processes	DN American follows well-established software development guidelines and practices revolving around the Capability Maturity Model and 6 Key Practice Areas. <ul style="list-style-type: none"> ▪ Requirements Management ▪ Software Project Planning ▪ Software Project Tracking and Oversight ▪ Software Quality Assurance ▪ Software Configuration Management ▪ Software Subcontract Management
	Established Software Development Process utilizing internal project tools.	DN American provides the necessary infrastructure to insure a successful project deployment. <ul style="list-style-type: none"> ▪ ProcessMax® Software CMM Tool ▪ Tag-Up© - A project collaboration tool
Established Industry Strengths	Close working relationship with Polymer Alliance Zone of West Virginia	DN American works closely with the PAZ in relationship to a closed-loop recycling project that is part of MARCEE project.
	Working relationship with R&D efforts relating to recycled plastics	DN American continues to work with West Virginia University on MARCEE project initiatives.

Table 2 – DN American’s Advantages in Supporting the EPEAT Project		
DN American Discriminators	Competitive Advantage	Benefit to the EPEAT Project
	Industry recognition for work in technology fields relating to electronics recycling	DN American has presented/authored papers relating to the electronics recycling industry: <ul style="list-style-type: none"> ▪ Use of XML on Supply Chain (IEEE 2004) ▪ Information Technology Architecture (IEEE 2005) ▪ Information Exchange/Collaboration (Bilbao Spain 2004)

Table 3 – DN American provides detailed information relating to DN American’s services on the previously mentioned projects.

Table 3 – DN American References	
Name of Contracting Agency	West Virginia University Research Corporation
DN American Contract Number	Grant Number: DE-FC26-00FT40598
Technical Contact	Carl Irwin – Technical Program Manager P.O. Box 6064 NRCCE Building West Virginia University Morgantown, WV 26506
Phone Number	(304) 293-2867 ext. 5403
Name of Contracting Agency	Polymer Alliance Zone of West Virginia
DN American Contract Number	PAZ-2001-003
Technical Contact	Buddy Graham – President Polymer Alliance Zone 104 Miller Drive Ripley, WV 25271
Phone Number	304-372-1167
Name of Contracting Agency	EPA Plug-in to Recycling Program
DN American Contract Number	
Technical Contact	Katharine Osdoaba
Phone Number	(703) 308-8659

4.0 Technical Approach

DN American has reviewed the EPEAT Requirements document for the design, development, implementation, and maintenance of a web-based database system, as provided by the EPEAT Implementation Team. This section discusses our structured software development approach, which will follow the Capability Maturity Model (CMM®) Level 2 guidelines for software development projects. DN American currently utilizes the ProcessMax® system for maintaining CMM compliance on all software development projects. This assures our customers that we can deliver high quality software products and services with the right amount of project management oversight.

Our structured process described in section 3.2 details primarily the process needed to address the needs of the EPEAT project. Furthermore, DN American will employ a joint application development process, which provides the ability for the EPEAT Implementation Team to provide input throughout the development process.

4.1 EPEAT Needs

The following section details the requirements set forth by the EPEAT Implementation Team for the web-based database system. The system specifications are broken down into two areas consisting of a web-based front-end application and a database backend solution. The following specifications were extracted from various EPEAT related documents. These documents include:

- Project Overview
- Project Charter
- Communications Plan
- Risk Management Plan
- Draft Requirements Document

4.1.1 EPEAT Web Site Specifications

1. The web site shall contain general EPEAT informational pages for which content will be provided by the EPEAT Web Application Steering Committee.
2. The web site shall contain information relating to history of the development of EPEAT.
3. The web site shall contain definitions and glossary information.
4. The web site shall contain an explanation of the EPEAT rating levels.
5. The web site shall contain EPEAT contact information.
6. The web site shall contain a list of companies with EPEAT MOU agreements.
7. The web site shall contain a searchable database with rating information for products.

4.1.2 EPEAT Database/System Specifications

Database System will store/retrieve information relating to the EPEAT rating system.

1. EPEAT system shall allow manufacturers to make on-line declaration submittals.
2. EPEAT system shall provide validation checking of reasonableness of the submittals via required fields and allowable ranges.
3. EPEAT system shall allow procurement officials to search for products by rating level
4. EPEAT system shall allow procurement officials to search for products by manufacturer
5. EPEAT system shall allow procurement officials to check on specific characteristics (i.e. review declarations sheets.
6. A version of database criteria shall be available for manufacturer's in-house use to enter product information.
7. The EPEAT system shall have the ability to archive product information.
8. The EPEAT system shall provide ability to assign expiration dates to products.
9. The EPEAT system shall provide a date created for product information records.
10. The EPEAT system shall be browser independent.
11. The EPEAT system shall not rely on proprietary tools.
12. The EPEAT system shall utilize a web-based interface.
13. The EPEAT system shall include business rules for SQL injection attacks.
14. The EPEAT system shall include business rules for buffer overflows.

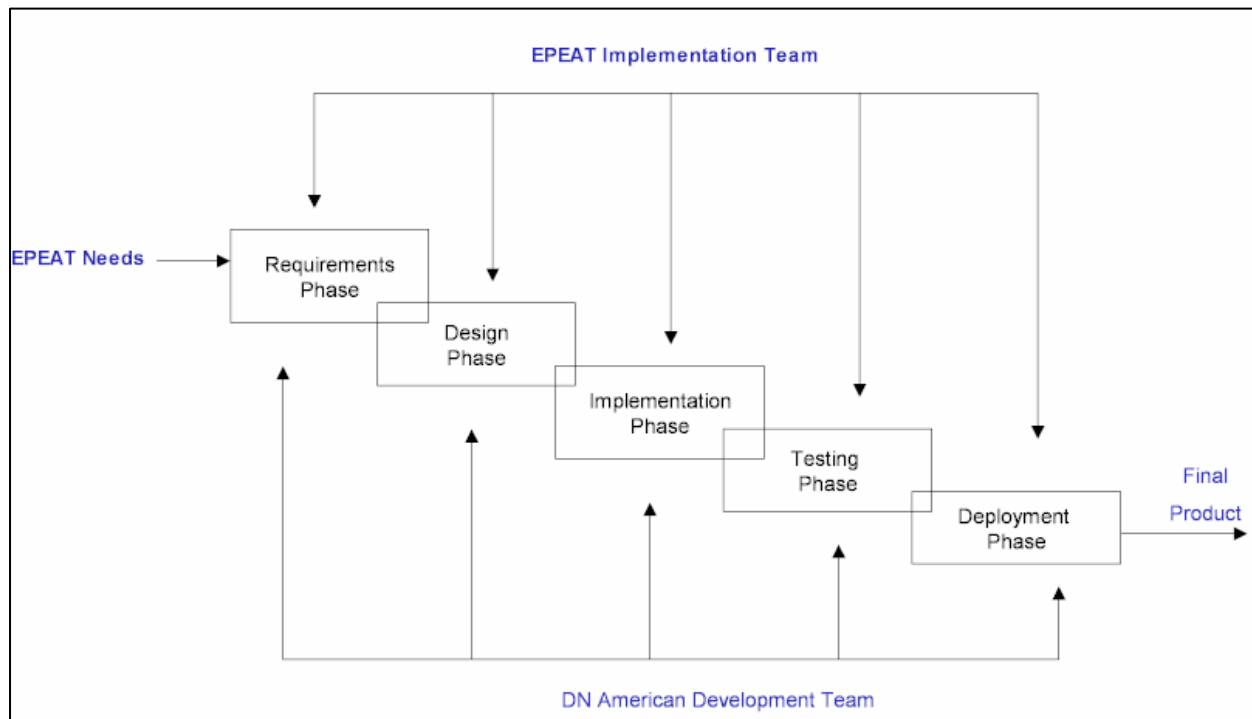
15. The EPEAT system shall provide user authentication via username and password.
16. The EPEAT system shall provide graduated access for different levels of user authentication.
17. The EPEAT system shall provide printer-friendly versions of search results.
18. The EPEAT system will generate refined lists of qualified product models based on the product features, functions, and performance criteria that interests users.
19. The EPEAT system shall be tested with Section 508 compliant tools.

4.2 DN American's Structured Development Process

DN American will utilize a hybrid structured software development process that utilizes a joint application development process with a more traditional cyclical development model. This process is a hybrid process based upon the life cycle development processes that DN American has followed rigorously for the Department of Defense, National Aeronautics and Space Administration and the Department of Energy.

DN American strongly believes that a well defined development cycle with simple, yet rigorous processes will allow us to deliver on time an efficient software system for EPEAT. The following phases represent DN American's meta software development life cycle process for the EPEAT project:

- Requirements Phase
- Design Phase
 - Internal Design Segment
 - External Design Segment
- Implementation Phase
- Testing Phase
 - Unit Test
 - Module Test
 - System Test
 - Acceptance Test
- Deployment Phase
 - Customer Training
 - Maintenance (If Applicable)
 - Support (If Applicable)



Although presented in a sequential manner, these processes are highly iterative and, in some cases, accomplished concurrently, as illustrated in Figure 2 – DN American Meta Process for the EPEAT Database System. This is the meta process DN American intends to follow to deliver the EPEAT database system. Figure 2 shows that the high level phases are interlocked with one another, this denotes the concurrency, feedback and iterative nature of the process.

Furthermore, the diagram depicts the notion that both DN American and the EPEAT customer are always linked with the meta process to assure that:

- DN American realizes the customers needs at each phase, and;
- the customer realizes the development of the system at each phase.

The following sections detail each phase of the DN American meta process by describing the necessary activities that must be performed to meet the delivery of the EPEAT database. The process detailed below provides the framework for the phases outlined in our schedule (which can be found in the Section marked Schedule).

4.2.1 Requirements Analysis Phase

This phase is considered to be the most crucial phase of the life cycle. During this phase we will discuss with the customer his/her needs and capture them for use in the Design phase. Although we have reviewed the functional needs of the EPEAT system, we have not translated those needs into detailed requirement specifications, quantified them or decomposed them to insure adequate coverage.

DN American will interview the customer, to verify the draft final requirements, detail them and model the relationships between the functions. We will prototype the system, in a storyboard fashion, to assess clear definition of our understanding of the customers needs.

As we progress through the Requirements Analysis phase we will document the following type of information in a streamlined Requirements Specification Document (Section 2.4.2):

- functions or operations to be provided by the system
- performance needs
- timing constraints
- system constraints
- environment constraints
- inputs and outputs and their respective rates
- system loads
- data requirements
- security requirements
- human factor considerations (interface issues)

4.2.2 Design Phase

During the design phase, the external and internal designs will be divided into separate segments.

The external design phase will detail the various external interface characteristics of the system. This information will be defined in the RSD and will identify the external systems with which the EPEAT database will interact. Based upon the external systems definition, the subsequent EPEAT subsystems will be modeled with the appropriate inputs and outputs, security and interfaces.

The internal design phase will detail the inter-processes and subsystems of the EPEAT database. This will essentially detail the entire EPEAT architecture and appropriate relationships, attributes of the various modules and structures.

The logical and physical data model, schemas, subschemas, records, tables, etc. will be provided for the Microsoft SQL Server database. This information will be modeled by using various data modeling tools at DN American's disposal. Utilizing these tools a detailed entity relationship diagram for the database and the domain specific terminology will be documented in a data dictionary.

The new system's user interface screens will be determined and they will be modeled using Microsoft ASP.NET. Type of navigation between various screens and database will be determined, as well as the creation of various report views which will commonly be used by EPEAT personnel and site visitors.

DN American will carefully define the design specification by using the RSD as a ruler or guide to insure the design is meeting the true requirement. However, we will also insure that as the design progresses and if requirements need revised, a concerted effort will be made to adjust accordingly. Prior to any changes to the RSD DN American will notify and review the requirement in question with the customer.

Various solutions will be introduced for the problems identified during the Requirements Analysis phase, however, with the approval of the EPEAT Implementation team, DN American

will select one architecture and proceed to Implementation . The selected architecture will be flexible to accommodate expansion of the software system and will contain reusable components (leveraging object-oriented design techniques). This approach will provide EPEAT with confidence that the new system fits within the overall organizational architecture such that it provides orderly development, communications and transitions to and from other EPEAT systems.

4.2.3 Implementation Phase

During this phase the developers will begin the actual coding of the modules or subsystems defined in the design phase. DN American will use Microsoft Visual Studio to code the interface applications to the Microsoft SQL Server inventory database.

The physical database will be created from the baselined logical data model defined in the Design Phase. The overall size of the database will be determined by the applicable module and based upon the system developer's detailed knowledge.

4.2.4 Testing Phase

Testing will be performed in 3 segments (Phase I, II and III), however, DN American is responsible for results in Phase I. During Phases II and III, the testing will be accomplished by DN American and EPEAT Implementation personnel. During each of these segments we will document a test plan, which outlines a set of instructions to test each functional requirement. A test readiness review will be held to review both format and content of the test plan document. At this point, a system demonstration will be available for customer review. Each test will be independently run and the results documented. A test analysis report will be developed detailing the test results. The test analysis report will be reviewed by the customer and feedback will be required.

The types of tests that will be performed during this approach are as follows:

- Function testing
- Module testing
- Subsystem testing
- System testing
- Acceptance testing

DN American will conduct Phase I testing at our development site, using our software development test-bed, which includes IIS web servers, SQL Databases, and various web clients. Testing shall be conducted using the Phase I test plan. Phase II and III testing will be conducted in conjunction with EPEAT Implementation personnel.

4.2.5 Deployment Phase

Once the final testing of the Alpha application is complete (i.e., acceptance testing) DN American will implement full-scale deployment of the functional, integrated system. All deliverables will be turned over to the customer including, but not limited to: Database schemas, materials, and source code. At this point, the Microsoft SQL Server will be switched from utilizing test data to live, production data. DN American will load the SQL Server database and data onto the server, following which we will provide a CD-ROM containing the necessary UI and applications for the end users.

4.2.5.1 Training

DN American will provide training on the use of the system to EPEAT Implementation personnel prior to deployment of the full system. During the Implementation and Testing phase we will determine from interviewing the EPEAT Implementation staff on the type of training that would best suit their needs and requirements.

4.3 *Recommended Technical Solution*

4.3.1 Recommended Software Solution

DN American recommends leveraging the information technology architecture already developed in support of the MARCEE project as the foundation for the EPEAT system. This architecture is based around the use of Microsoft technologies including Microsoft SQL Server and the Microsoft .NET Framework. This solution provides for a multi-tiered web-based application utilizing a front-end Microsoft IIS web server and a backend Microsoft SQL Server database. Other technology solutions were evaluated but from the total cost of ownership perspective, DN American recommends utilization of a Microsoft based solution. This recommendation is based upon the following criteria:

4.3.2 Total Cost of Ownership

DN American's Total Cost of Ownership analysis indicates that a Microsoft solution is more cost effective than leading Linux based Relational Database Management Systems (RDBMS). An independent research company, IDC, in a study initiated to discover what differences, if any, exist in the cost profiles of database development products found that the "Linux RDBMS users encountered a 46.8% higher overall cost (estimated annual normalized costs per 100 tables) in developing their databases and database applications."¹ IDC attributes the differences in cost to the following factors:

- Linux RDBMS products require more expertise and therefore higher salaried employees
- Linux RDBMS products require more time spent on administrative tasks
- Linux RDBMS products have higher license and maintenance fees

Other recommended Total Cost of Ownership references include:

- <http://www.microsoft.com/sql/evaluation/compare/IBM/DB2v8.asp>
- <http://www.microsoft.com/sql/evaluation/compare/pricecomparison.asp>
- <http://www.microsoft-watch.com/article2/0,1995,1553620,00.asp>
- <http://www.microsoft.com/windowsserversystem/facts/analyses/opencost.msp>

4.3.3 EPEAT Application Security

In regards to information security, DN American recommends taking a multi-phased approach. The first phase will address application development issues relating to the development of a web-based application. The DN American software development team will utilize industry standard practices for handling data integrity including testing for SQL injection attacks, buffer overflow, and data validation. The second phase will deal primarily with the confidentiality of the

¹ http://download.microsoft.com/download/6/4/b/64b07be2-0912-4c71-9341-343fc67bec26/SQL_LinuxDevCosts.pdf

EPEAT data. In coordination with the EPEAT Implementation Team DN American will identify where data will be accessed according to different privileges or classifications. Where necessary DN American will utilize Secure Socket Layer (SSL) access to data and provide varying levels of user authentication to provide secure access to data. The third phase will deal with the physical and network access layers for the EPEAT application. This will include providing router/firewall filtering for access to the DMZ security zone where the EPEAT Web Server will reside. This will also include the port level access between the web server and database server. The network architecture will also identify where third party software such as anti-virus, intrusion detection, network logging applications, and application monitoring will take place. The final phase will be the identification of any information compliance standards that will need to be enforced with regards to the EPEAT data. DN American will work with the EPEAT Implementation Team to address these issues during the requirements analysis phase.

4.4 Justification for Recommended Technical Solution

As part of the technical solution proposed in this document the following considerations were taken into account when recommending a Microsoft Solution over an Open Source Solution.

4.4.1 Hardware / Server Infrastructure Considerations

- The EPEAT tool can leverage the return on investment made by the MARCEE project and their existing information technology infrastructure based around Microsoft technologies. This includes web servers, application servers, database servers, and development tools.
- The improved security focus of Microsoft on all of their mission critical server and database products helps reduce the argument of using Open Source for better security.
- The total cost of ownership of an open source database can be higher due to lack of administration tools compared to Microsoft SQL server platform.
- Long term costs of hosting application and administration costs associated with a Windows solution are typically less than compared to a Linux based solution.
- Enforcing design rules that allow database structure and data to be ported from Microsoft database platform to other database platforms in the future if desired by EPEAT host organization.
- The ability to access professional technical support from Microsoft compared to using open source news groups.
- Ability to leverage that DN American is a Microsoft partner and has access to technical and developmental resources through their relationship with Microsoft.

4.4.2 Software Development Infrastructure Considerations

- Reduced time frame for development by utilizing more well defined Microsoft .NET architecture components compared to writing additional code required by many open source-based languages.
- Ability to use third-party software components where needed. There are thousands of developers creating components for Microsoft platforms compared to open source platforms.
- A Microsoft .NET solution provides better integration with Microsoft tools such as Microsoft Office, Word, Excel, etc.

- Software development tools are much more refined for Microsoft solution than Open Source solutions.
- Future enhancements to EPEAT tool such as XML support or web services integration are easier and less time consuming utilizing a Microsoft solution compared to an open source solution.
- Enhanced Microsoft SQL Server database tools such as Analysis Services and Reporting Services.
- Built-in Microsoft administration tools for IIS web server management
- Built-in Microsoft SQL Server database administration tools
- Microsoft.NET development environment provides language-independent support

5.0 Project Management

To accommodate a quick turn around on the EPEAT database system, DN American proposes to use a technical management structure, which will rely on the system developers maintaining most of the day-to-day management functions. DN American Headquarters personnel will track and monitor the progress of the effort and provide monthly status reports to the Implementation Team.

Day to day technical management of the project will be the responsibility of the EPEAT development Project Lead for DN American: Terri Linger. The customer is encouraged to interact with the lead system developer as needed in order to have visibility into the project.

Day to day contractual or/and additions or subtractions to the statement of work must be discussed with the EPEAT development Project Lead and provided in writing and directed to the MARCEE Implementation Manager or DN American project management.

It is recommended that any and all formal interactions, both by DN American and the EPEAT customer, be documented either in a memo or email to both the Project Lead and the MARCEE Implementation Manager (Walter Alcorn).

In addition to the traditional project management activities DN American will be utilizing their internal CMM® compliant workflow tool for managing all software development tasks. This system is web-based and provides access for customer interaction especially with regards to change requests and software development activities. Use of this tool will be provided free of charge during the development of the EPEAT database system.

5.1 Reports and Deliverables

This section identifies the various reports and deliverables that will take place during the project lifecycle.

5.1.1 Progress Reports

Progress reports will be delivered to the EPEAT Web Steering Committee every 30 days that detail project status, issues, or problems needing attention, etc. In addition DN American will be utilizing its own project collaboration tool called Tag-Up© which allows for daily team/customer collaboration. Use of this tool will be provided free of charge during the development of the EPEAT database system.

5.1.2 Requirements Specification Document (RSD)

The RSD shall document DN American's understanding of the functional requirements as extracted from the SOW and supplemental documents. This will be a streamlined version of a RSD due to the rapid development of the EPEAT database.

5.1.3 System Manual

A System Manual will be created to fully support the database (operate, maintain, troubleshoot, etc.).

5.1.4 Source Code / Database Schema

The final deliverable will be the completed source and database schemas and all supporting documentation.

5.2 Meetings and Briefings

DN American will participate in and host the necessary reviews with the customer. Typically, the meetings will be held via conference call. However, DN American will be available to meet at the customer site, our facilities, or locations designated by the customer. When meetings are held at DN American's site, we will provide adequate conference space to accommodate the planned attendance and provide administrative support as determined by the purpose and nature of the meetings. We will take minutes at every review and distribute them no later than 5 days after the review.

5.3 EPEAT Development Team Personnel

5.3.1 Jeffrey Tucker (Business Line Manager - Enterprise Business Solutions)

Mr. Tucker has over 13 years experience in the field of Information Technology and Software Engineering. He holds a Master's Degree in Software Engineering from West Virginia University. Mr. Tucker has managed numerous projects at DN American and currently oversees all Web-Based application development within the Enterprise Business Solutions area of DN American. He has worked on government projects with the Department of Treasury, Department of Energy, NASA, and EPA, and several commercial and non-profit organizations. His technical background includes Relational Database Systems like Microsoft SQL Server and Oracle as well as web-based projects utilizing both Microsoft IIS and Apache web servers.

5.3.2 Terri Linger (Project Lead/Software Developer)

Ms. Linger holds a Master's Degree in Computer Resources and Information Management. With more than 10 years experience in the Information Technology field, Ms. Linger has spent the past 5 years leading and playing a key role in developing several web-based database projects as described in more detail in Section 2.0 of this proposal. The bulk of Ms. Linger's technical experience involves Microsoft technologies including Microsoft IIS, Microsoft SQL Server, and ASP.NET. In addition, Ms. Linger is committed to software process improvement and has experience in the role of Configuration Management Manager.

5.3.3 Walter Alcorn (MARCEE Implementation Manager)

Mr. Alcorn has worked in progressively responsible positions in the IT and environmental industries since 1992. He served as Deputy Division Manager of the Advanced Internet

Applications Division at Science Applications International Corporation (SAIC), where he also served as product manager of GreenOnline.com and managed development of 3 simulation and static models of the electronics recycling system in the United States. In 2003 Mr. Alcorn formed his own company and has provided management support to the MARCEE project and, in 2004, technical support to the Electronic Industries Alliance (EIA). He is now working as a co-founder of the National Center for Electronics Recycling (NCER) located in Parkersburg, West Virginia. He has also served his community since 1997 as an At-Large member of the Fairfax County, Virginia Planning Commission.

6.0 Schedule

6.1 Deliverables

Deliverable	Responsible	Target Date
Draft Requirements	EPEAT Implementation Team subcommittee & Development Team	12/31/04
Draft Final Requirements	EPEAT Implementation Team subcommittee & Development Team	1/30/05
Project Go/NoGo Final	EPEAT Implementation Team	2/15/05
Analyze and summarize final detailed requirements	EPEAT Web Application Development Team	3/1/05
Present final recommended solutions to Web Application Steering Committee	EPEAT Web Application Development Team	3/15/05
Review and comment on story boards	Development Team	4/15/05
Mockup application for interim testing	Development Team	5/15/05
Beta application for pilot test	Development Team	7/15/05
Alpha application for final test	Development Team	9/30/05
Final go-live application	Development Team	01/05/06

6.2 Proposed Timeline

