AADE-11-NTCE-70

QC-DOC: Web-Based Centralized Application for Authentication of the Quality Assurance System

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Abstract

Quality assurance (QA) is the process used to help ensure products and services are fit for purpose and right the first time. A newly introduced QA system for a major service company follows a structured and well defined process to help ensure quality and vendor compliance. This process is managed using a centralized web-based authentication system (WAS) called QC-Doc

QC-Doc is a real-time role-based system designed to manage product life-cycle including product history, vendor and lot management, testing procedures and results data. This system has automated and streamlined the previously used Quality Management System (QMS) and quality workflows. Consequently, the number of non-compliant vendors has dramatically decreased resulting in less intervention and fewer corrective measures. Additionally, the system provides shelf-life management leading to less product spoilage.

The system provides global access to product status within the various QA workflows. Users can view product history, test procedures, QA lab results, vendor test results, and lot shelf-life. Vendors can view their test results history relative to product lots as well. Using the global product database additional statistical analysis of vendor and product performance metrics can easily be obtained. A dashboard component allows real-time monitoring of the holistic QA process.

This paper describes the system specifics and implementation details and demonstrates the systems benefits.

Introduction

Oilfield companies buy material worth millions of dollars every month and each chemical is utilized for a unique application. Quality assurance (QA) is at the heart of the business through the use of cutting edge technologies for standard testing to help ensure the right product usage and to improve overall revenue of the organization. Success of many quality assurance systems (QAS) is focused directly on the customer's satisfaction. The quality assurance system is defined by the organization so that the products or chemicals consumed for a specific application meet pre-defined specifications.

QA plays a vital role in product testing and approving drilling fluid additives, choosing the right method of testing, and monitoring the incoming material's suitability for the required application. Using a non-conforming chemical in a drilling operation can lead to significant damage in the process which may result in heavy losses to the organization. For this reason many industries implement best possible testing procedures and specifications for their QA processes to help ensure they are in line with their expectations. Performing effective quality testing improves service quality and enhances profitability for the organization.

In any industry many systematic methods are available for the process of authentication of the quality assurance system (AQAS). However, there are many challenges to maintaining the most effective, user friendly and easy to follow technologies in the area of AQAS. The major oilfield service company discussed in this paper follows a defined process for quality compliance through use of the web-based centralized authentication system (WAS) called QC-DOC. WAS is the real-time role-based system designed to manage the product life history, vendor and lot management, test protocols and procedures, and test results history. QC-DOC provides specific advantages over other systems.

This real-time system allows the role-based users, vendors, and the company to view globally the product history information, lab results, vendor's COA details and shelf life, among other things.

Global storage of the product test information allows the WAS system to monitor test data and the process on a real-time basis to help in performing additional statistical analysis on vendor and product performance.

Also, the WAS system helps users avoid duplicating product testing between the regional labs and provide better service quality in traceability, interface, and swift delivery of results on a real-time basis.

What Is WAS?

As noted above, WAS is designed to manage products for QA/QC lab results, vendor quality compliance agreements (VQCA), vendor certificates of analysis (COA), and certificates of quality (COQ). The quality assurance group uses the system to log samples through the QA LAB option, which stores every lot, tracks testing, and provides global access. WAS provides the real-time status of products in terms of whether they're logged in, in-process, under review or pass/fail, and provides the status of the product's shelf life for reference. WAS benefits procurement groups through real-

time alerts regarding vendor signatures and electronic storage of VQCAs. Supply chain/Logistics teams utilize the system to produce COQs for international and domestic shipments. The WAS work flow is defined in a flow chart (Figure 1).

Need for WAS

Globalization forces every industry to update or improve their system continuously through innovation. International standard systems like ISO and TQMS all encourage continual improvements in industrial processes; updating the process helps sustain market share. Quality assurance systems follow a systematic authentication process. While many companies use hard copy documents for their process, the real-time WAS system has allowed an oilfield service company with many QA labs in various regions to support customers with swift delivery of results and reduce the cost of testing by sending samples to the nearest global or regional lab. Implementation of WAS in regional QA labs increases support for customers.

WAS moved this QA system into the next generation by placing the global and regional labs authentication process under a single umbrella, providing centralized control and monitoring capability for the organization's overall QMS.

WAS System Advantages

WAS is a technically superior and stable system, as compared to other methods currently practiced in the industry. Some of the beneficial features include:

- Easy product and vendor management
- Report data readily accessible by user
- Speedy decision making over the product and vendor compliance
- Improved support for shelf life tracking
- Coupled product test protocols and specification
- Improved company-vendor interface
- Role based access with enhanced security
- Improved product and vendor evaluation
- Enhanced new product registration facility
- Easy generation of Certificate of Quality (Figure 2)

QC-DOC Role-Based User Control System

The QC-DOC real-time role-based security system provides better control of WAS usage from user to user. The global quality lead (GQL) has command and control of the database. The GQL determines user roles based on their positions with the company and provides a user ID and password. Then the user can log in to QC-DOC and initiate applications. In case of erroneous entry the user can upload the test results several times by adding new experiments, but the completed experiment entry cannot be changed by the user at all. These error entries can be tagged and deleted by the QC-DOC owner only.

Product and Vendor History

WAS provides information on the product and vendor history by storing all active and inactive data. The resulting data can be searched by VQCA, COA, products, vendors, samples, etc. Based on the real-time and hands-on data, the evaluation of products and vendors can be made efficiently.

Additionally, WAS allows the GQL to view the performance of the product and vendor. Comprehensive data available on WAS helps the company grade the vendors. These data reviews of the data make it easy to promote or demote a vendor (Figure 3).

Product Test Protocols and Specifications

All organizations aim to satisfy the customer by aligning better processes and understanding the customer's needs. The customer's expectations are satisfied by providing the best service quality through the right products using precise testing methods. Lab testing consists of standard testing procedures and test specifications (Figure 4).

In WAS, standard testing procedures (STP) and specifications are loaded into the database to provide reference for the users. WAS provides real-time status on a product based on the results with respect to specifications, from log in, in-process, under review and pass/fail. This helps the GQL obtain transparent data on a real-time basis for both lab samples and vendor COAs.

Vendor Management and VQCA Agreements

The major oilfield service company works very closely with its vendors to help ensure consistency, responsiveness, and adherence to specifications. A VQCA is established with each vendor. Through this agreement the vendor agrees to supply products which meet QA specifications as defined by the organization. The vendor will perform specified tests on each lot of material and provide samples and/or COAs to the company through QC-DOC.

The WAS system streamlines the process for the development of new and existing vendors, through VQCA (Figure 5). New vendor samples are tested and monitored thoroughly.

Based on their performance, vendors are graded from level 1 through 4. Each product's QA specifications and chemical formula are shared with vendors confidentially. Live documents of these vendor agreements, product specifications and vendor supply grade (1 through 4 with respect to product and vendor quality) are combined in WAS. Changes in VQCAs are updated from time to time. Vendor management and VQCA data is protected by offering limited access to users. Based on the results uploaded into WAS from different regional labs for various products, the GQL can analyze the vendor's performance on a real-time basis and decisions for promoting/demoting a vendor to the next level can be made easily, reducing time and efforts of the company's resources

New Product Registration

The WAS system provides flexibility that accommodates more new products into the database with respective test protocols and specifications. Specifications of the new product and its testing procedures are kept open until the product is approved by the company through a number of evaluations and validation processes. Once the test protocols and specifications are finalized the system owner freezes the page

to secure the product test details (Figure 6) and then the system displays the name of the product (as decided by the company) with testing specifications and procedures.

Conclusions

WAS provides immense support to the users globally by offering an accurate web-based authentication process. This real-time authentication process helps streamline the QA system day-to-day activities through centralized real-time features about product data management, vendor management, shelf life alert, product test protocols and specifications, secured access based on the role, vendor quality compliance and new product additions in the existing QMS system. A wide range of data is available to improve QA system management and add value to the organization. The WAS system can be considered the next generation for the QA process and will support continual growth of the organization in the future.

Acknowledgments

The authors would like to thank Halliburton for permission to publish this article.

Nomenclature

AQAS---Authentication of Quality Assurance System
GQL---Global Quality Lead
ISO---International Standards for Organization
QA ---Quality Assurance
QAS---Quality Assurance System
QMS---Quality Management System
TQMS---Total Quality Management System
VQCA---Vendor Quality Compliance Agreement
WAS---Web based Centralized Authentication System
COQ---Certificate of Quality
CATMGR---Category Manager

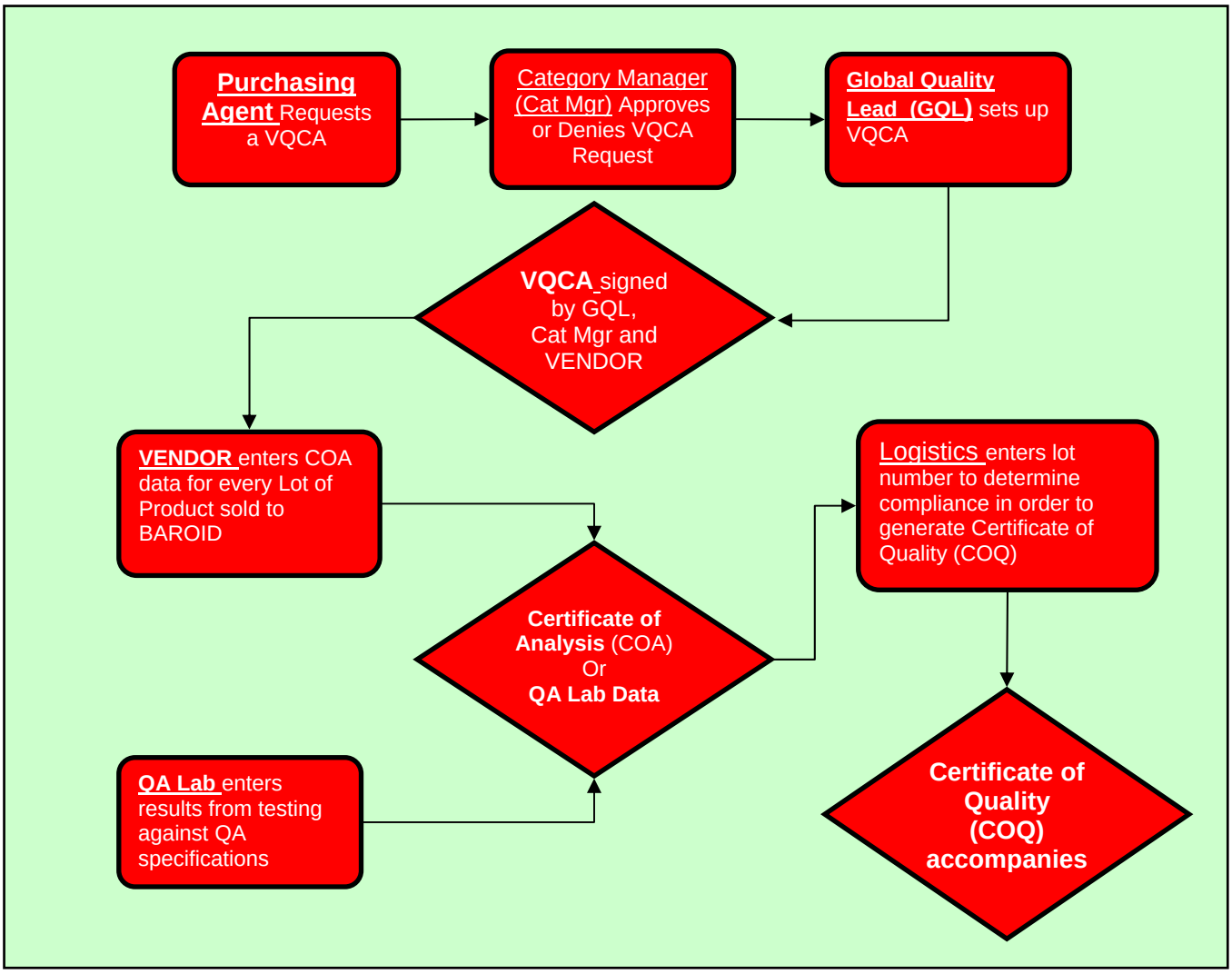

Figure 1: Process Flow Chart of QC-DOC

CERTIFICATE OF QUALITY

BENTONITE

Unknown

Production Date: 11/29/2010
Lot No.: 1
Shelf Life: 5.0 Years
Destination: test
Delivery Number: test

Baroid certifies BENTONITE, Unknown, will meet the following specifications as shipped from point of manufacture:

Test	Specification	Procedure
Appearance	Tan to Gray Powder	Appearance

NOTE: These specifications may be revised or updated without prior notice. Customers are requested to reference quality requirements directly on purchase documents as applicable.

Authorized by a Baroid Quality Assurance Representative 12/21/2010

BENTONITE

Figure 2: Certificate of Quality (COQ)

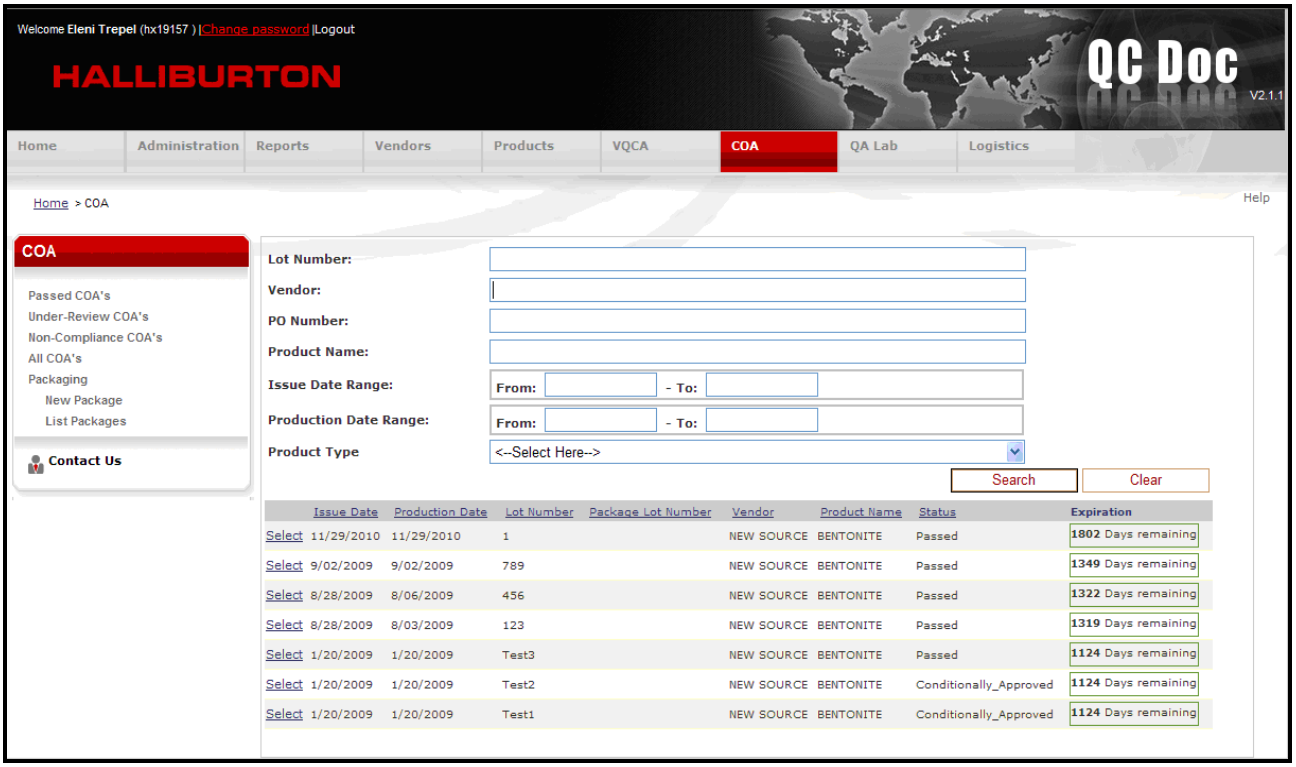

Figure 3: Product and Vender History

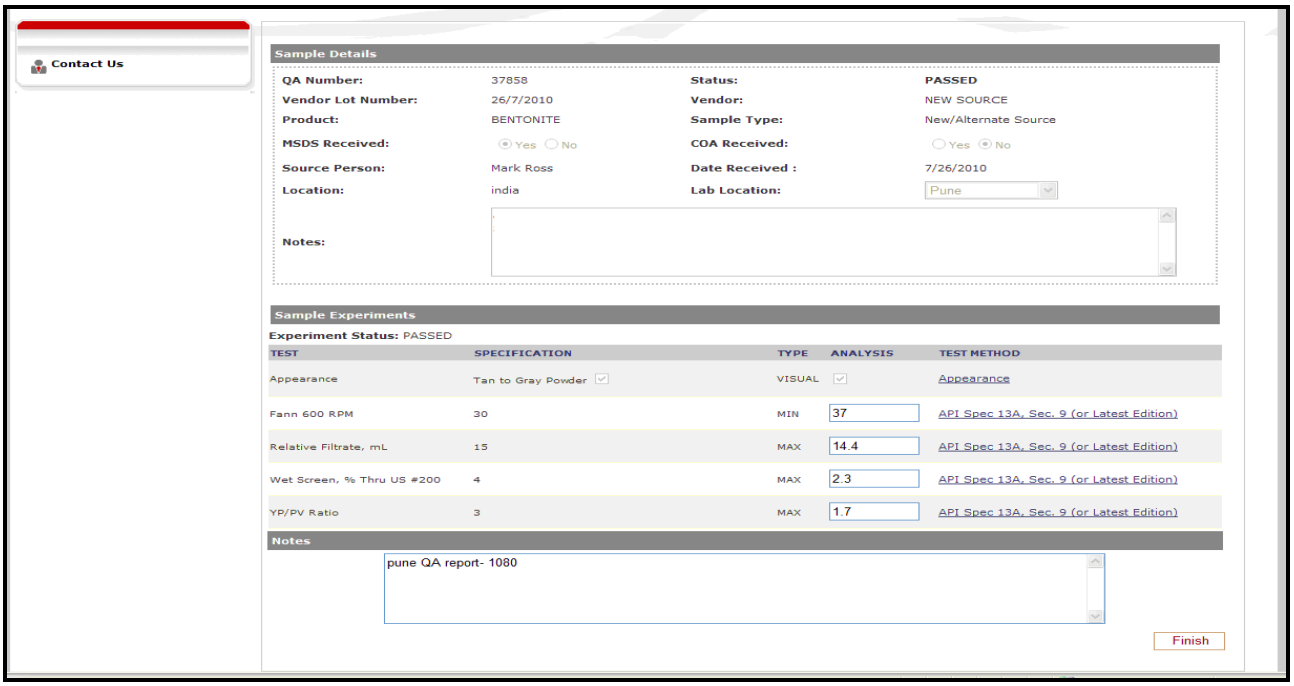

Figure 4: Product Test Protocol and Specification

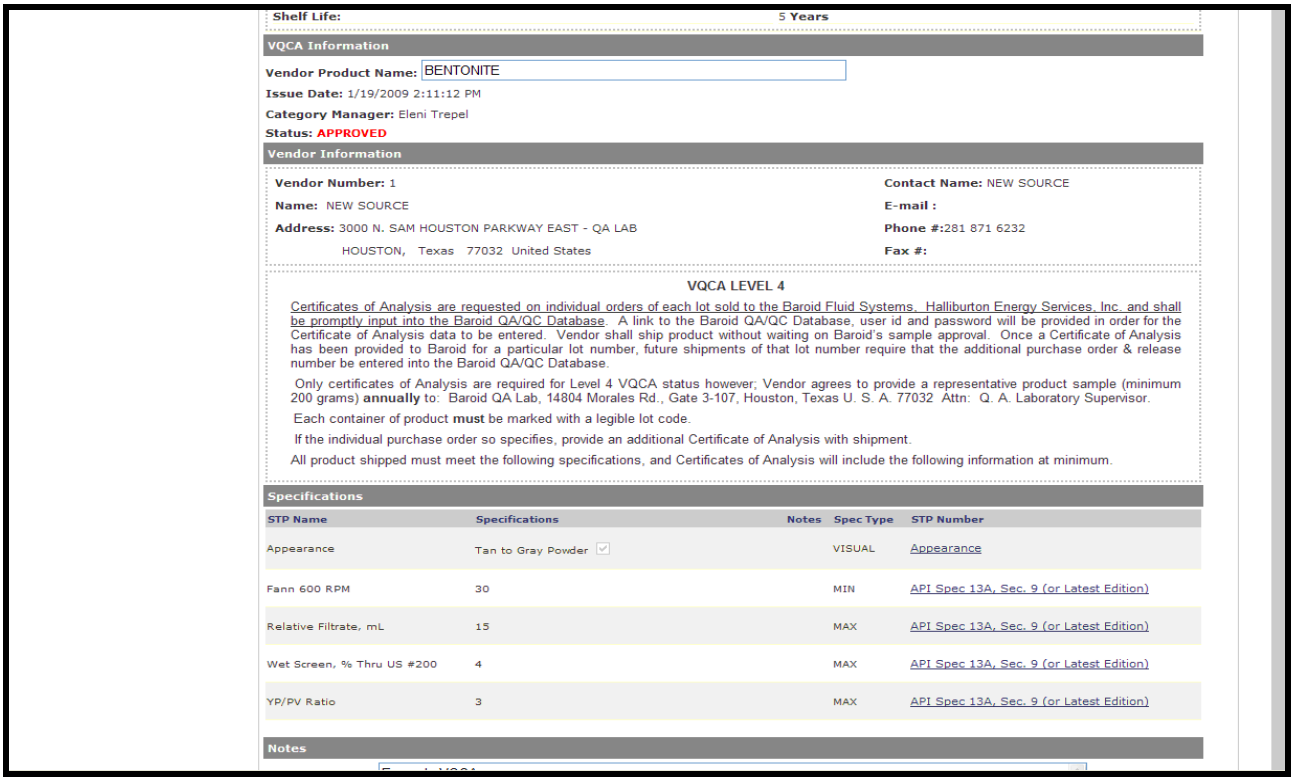

Figure 5: VQCA Agreement

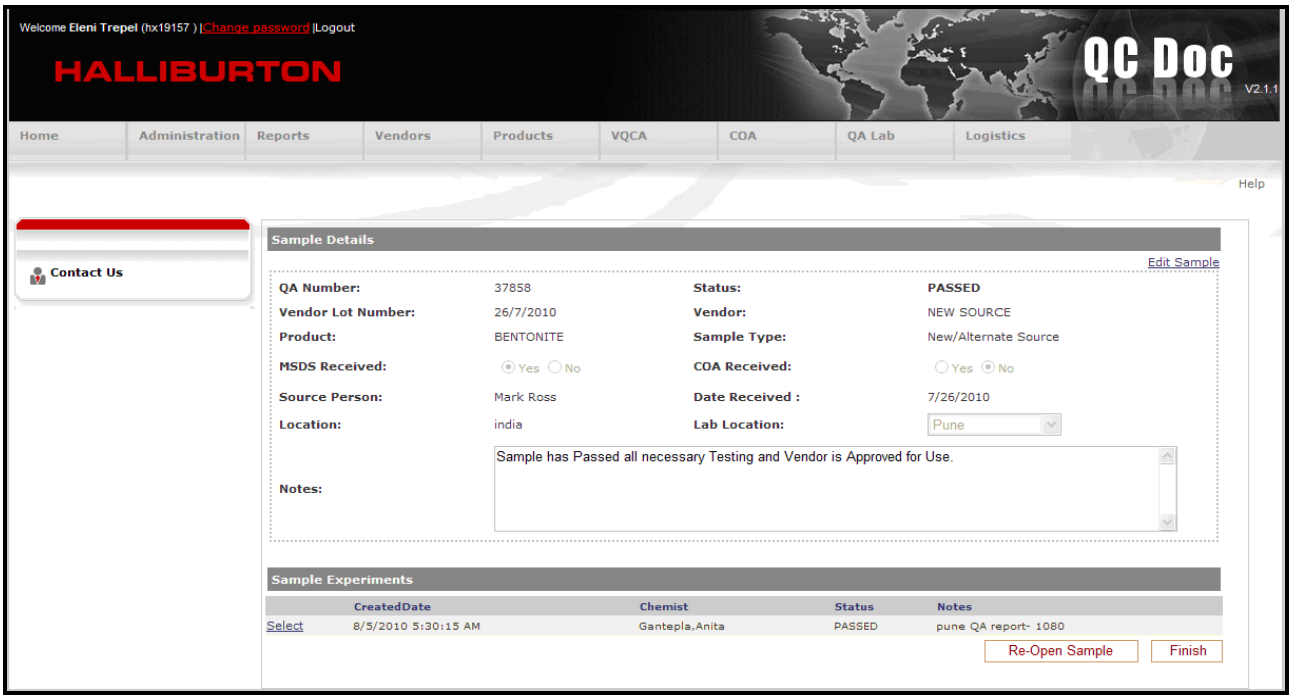

Figure 6: New Product Registration