

USDA-NRCS FINAL REPORT. September 2016

Credit Trading Registry for the
Ohio River Basin Water Quality Trading Project
2012 Conservation Innovation Grant
NRCS Grant Agreement 69-3A75-12-254
Grant Period: 9/1/2012 to 4/2016

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Project Objective

The objective of this project is to deliver registry services for Ohio River Basin Water Quality Interstate Trading Pilot Project that will be a web-based, fully hosted, centralized system that enables market participants to open accounts, manage their environmental projects, serialize and issue credits, manage active credit holdings and retire credits. It will be delivered on a central location that all market participants can use to access credits and participate in the Ohio River Basin Water Quality Interstate Trading Pilot Project activities. The Registry will deliver comprehensive reporting and activity logs, configurable regulatory approval functionality and a fully searchable public view that lists all public project and credit details. This project's on-line credit trading registry goals include creating transparency and efficiency, establishing trust and confidence, and maximizing market participation.

General Project Updates

During this project time period, we have developed full registry functionality that responds to the custom registry services specifically for the ORB program:

- This project received a one-time no-cost extension through April 2016.
- All costs have been incurred, cost-share met, and financial documentation set to USDA.
- The on-line registry has "gone live" and is hosted in the public view at: <http://wqt.epri.com>
- A full video describing the registry has been posted on the project website and described in the Project Update Newsletter attached to this report.
- All six state agencies were trained on the registry and are using it to approve credits.
- We have established functionality to host a public auction. This includes the ability for buyers to post bids and sellers to post offers. EPRI is the only "seller" at this time.
- A public auction was announced and marketed. However, not enough unique buyers came forward to warrant holding the auction. Credits will continue to be transferred to buyers via bi-lateral contracts.
- The project accepted the United States Water Prize in April 2015.
- All established credits posted on the registry.
- Project Audit has been completed including: HUC 4 and HUC 10 designations on the registry for projects, ancillary ecosystem services tracked, and actual state burden vs expenses. The full results of the audit will be publicly posted at <http://wqt.epri.com> by October 2016.
- Per USDA approval, \$100,000 of this grant was contracted to the State of Indiana and will be applied towards BMP installation in 2016 that may also generate carbon credits. These BMPs will be used to test "credit stacking" under EPRI's 2015 CIG award (#69-3A75-16-022).

Progress on Specific Deliverables

Task 1: Configure Registry Services for ORB Pilot Program – 100% Complete

After the original build of core program functionality, followed by refinement, we are now ready to train the state agencies to use the platform for approving and auditing credits. We have also determined the public view of the registry, developed a unique Project Naming system which will protect the identification of

farmers, and tested the transaction platform with the project team. We have registered project(s) and issue credits.

Task 2: Customized Public View, Upload Tool and Reporting – 100% Complete

The public view of the registry is important to create trust in the program. This will be the primary method of sharing credit details with stakeholders and the general public. We will be posting the public view a full project documentation flow, but will not be posting farmer-specific information. The credits will be aggregated at a HUC 10 level, meaning that the public can see what HUC 10 specific credits are generated in, but not the farm-specific address or name. Tasks 1 and 2, combined with the current functionality provided in Markit's Registry platform, provides the ORB with the fundamental tools it needs to begin water credit trading. This functionality is fully implemented and is in use.

Task 3: Request for Information (RFI) Platform – 100% Complete

One of the key aspects of the deliverables for this project was providing secure and robust infrastructure to facilitate water credit trading and transfer. The RFI platform is one of a few tools being tailored for this purpose. The full RFI platform has been built and we have tested with pilot trades.

Task 4: Configure Auctions Platform – 100% Complete

The auction platform task will deliver the market tool needed to bring water credit buyers and sellers together in earnest. The configuration of the auctions platform has been complete. An auction planned for May 20th was postponed, however EPRI is still processing bilateral trades.

Task 5: Pricing Information Services – 100% Complete

All market participants benefit from transparent delivery and communication of pricing and market information. This task has been implemented and the registry can now show pricing in the public view. We have also completed an initial price analysis, selling credits at \$10 per pound.

Task 6: Maintenance, Support and Hosting – 100% complete

Hosting and support have begun and will continue for the term of this grant. States still need to verify, certify, and post credits generated.

Task 7: NRCS Related Deliverables – 100% complete

Periodic reporting will document project activities, registry integration, stakeholder participation, project registration, credit issuance, market activities, and other deliverables. The reports can be used to assist in the infrastructure development of other markets and inform the national level agency discussions for establishing infrastructure guidelines for related ecosystems service markets. EPRI has participated in the USDA-NRCS collaborative group sharing WQT project updates and resources in the Chesapeake Bay and has supported Office of Environmental Markets in assessing the further development of NTT for edge-of-field load reductions. Further, we have participated in the National Network for Consistency in WQT and the Water Quality Trading Alliance.

The full EPRI Draft Report for the Registry Functionality is attached. It will be posted in the public view as EPRI Report # 3002009243 in September 2016.

This marks the successful completion of all anticipated deliverables under this grant. EPRI will proceed to formally close this project. We greatly appreciate USDA-NRCS support for this important effort.

EPRI Technical Report - DRAFT

On-line Credit Registry Functionality for the Ohio
River Basin Water Quality Trading Project

Report Number 3002009243

Project Manager: J. Fox

September 2016

ACKNOWLEDGMENTS

The following organization, under contract to the Electric Power Research Institute (EPRI), prepared this report:

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ABSTRACT

This technical report outlines Markit's Registry services delivered for EPRI's Ohio River Basin (ORB) Water Quality Trading Project. Markit's online, fully hosted, centralized system enables market participants (and regulators with oversight) to open accounts, manage environmental projects, serialize and issue credits, manage active credit holdings and retire credits. It is a central location that all market participants can use to access credits and participate in the ORB market and program activities. A systematic algorithm assigns the unique serial number to allow the credits to be tracked through their lifecycle. From issuance, to transfer (via results of a bilateral trade or auction), and ultimately to retirement, the serialized credit's movements are entirely tracked and auditable. The Markit Registry (the "Registry") also offers an anonymous online introductory platform for the over-the-counter (OTC) market that displays credits available for sale and purchase, trading ratio tool, "What-if" Attenuation Calculator, comprehensive reporting and activity logs, configurable regulatory approval functionality and a fully searchable public view that lists all public project and credit details.

EXECUTIVE SUMMARY

Markit's Registry services delivered for Ohio River Basin (ORB) Water Quality Trading Pilot Project (the Project) include a web-based, fully hosted, centralized system that enables market participants (and regulators with oversight) to open accounts, manage their environmental projects, serialize and issue credits, manage active credit holdings and retire credits. Registry is delivered on a central location that all market participants can use to access credits and participate in the Project activities. The Registry delivers comprehensive reporting and activity logs, configurable regulatory approval functionality and a fully searchable public view that lists all public project and credit details. There are three core objectives that an environmental market Registry should work to achieve:

1. Create transparency and efficiency
Markets work best when they are transparent and efficient. These objectives underlie the design and implementation of the infrastructure and tools available to the market it serves.
2. Establish trust and confidence
It is critical to nurture trust and confidence when building a new market and to use innovative methods, infrastructure and tools. As volumes and participation grow, it is important that the services are secure, the participants have been vetted and the infrastructure has capabilities to bring confidence to the regulators and the broader market.
3. Enable maximum participation
An environmental market must have maximum participation in order to deliver substantial volume and the desired level of environmental uplift. A Registry should be designed with these participation goals in mind, ensuring that any barriers to entry are only those that are essential for security and regulatory purposes.

Based on Markit's discussions with the Project stakeholder groups, we configured Registry services to encompass the following functions, which are further described throughout this report:

- Account opening and management
- Public access to information
- Registry security mechanism
- Project registration
- Nutrient credit issuance, transfer and retirement
- Comprehensive reporting
 1. Projects, issuances, holdings, retirements reporting
 2. Transactional Price report

In addition to the Registry services outlined above, Markit also provided Request for Information Platform (RFI), Trading Ratio Tool, “What-if” Attenuation Tool and Credit Management functionality for the attenuated credits.

In a market with a variety of credit and project types, it can be challenging to access potential buyers and facilitate transactions. Markit’s Request for Information (RFI) Platform is an anonymous online platform for the over-the-counter (OTC) environmental credits market that displays credits available for sale. The RFI Platform has been enhanced to allow for buyers to list their interest for purchase including indicating quantities and prices. These credits are searchable and viewable by registered participants. Upon expressing an interest in any credits, the buyer or seller can send an "Expression of Interest" to the credit seller (current EPRI), whereby the seller can permission the other party’s interaction. Introduction through the Markit RFI platform then enables the two parties to start discussions on the terms of a potential bilateral transaction.

RFI platform also provides a customized view to the ORB Project participants, allowing them to only view information relevant to the program for which they have permission. Additionally, the Platform calculates effective quantities and prices for credit trading between program participants. A key element of the calculation of a water quality trade is the attenuation that occurs between the location where a credit is generated and the location where the credit is utilized as an offset. Attenuation factors are calculated based on the Watershed Analysis Risk Management Framework (WARMF) Watershed Model for Nutrient Trading in the Ohio River Basin (EPRI Report #3002002811 and #1025820).

Markit used the attenuation factors to create an end-to-end credit management process to help reflect quantities on the buyer’s “Manage My Units” i.e. account holdings page. As part of this credit management process, the transfer tool will help sellers and buyers to reflect the results of their bilateral trades via a transfer form that also takes into account the attenuation factors between their respective Hydrological Unit Codes (HUC) 10 locations.

Markit also implemented a “What-if” Attenuation Calculator to enable compliance sellers and buyers to run through a variety of “what-if” scenarios by populating various combination of quantities/prices/origin and destination locations to view attenuated quantities and prices.

The RFI platform and credit management tools also provide the mechanism to support bilateral transactions that do not require attenuation factors, i.e. purchase of Stewardship Credits.

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1 ACCOUNT OPENING AND MANAGEMENT

ORB Project participants operate within an existing Markit Environmental Registry account structure. An account is required to give market participants a way to access the Registry, register projects, and manage holdings and transactions. When a new client wishes to open a Registry account, he or she will need to be granted a master account. This account type should be the primary type used within the Registry.

Account holders have the ability to request sub-accounts to suit their business needs. Sub-accounts serve as a means of segregating credits controlled by an organization and also allow organizations to create sub-accounts for their wholly-owned subsidiaries. For example, if a company has two wholly owned subsidiaries, the company may open sub-accounts for each entity to segregate credits into each account accordingly.



To request a new account please provide the following details.

Request a New Account		
Organization Details		
Registered Name *	Trading Name *	
<input type="text"/>	<input type="text"/>	
Classification *	Tax/VAT No *	
<input type="text" value="Choose One.."/>	<input type="text"/>	
Address 1 *	State/Province *	
<input type="text"/>	<input type="text"/>	
Address 2	Country *	
<input type="text"/>	<input type="text" value="Choose One.."/>	
City *	Zip/Postcode *	Website *
<input type="text"/>	<input type="text"/>	<input type="text"/>
Main Contact		
Name *	Email *	
<input type="text"/>	<input type="text"/>	
Phone *		
<input type="text"/>		
Billing Contact		
Name *	Email *	
<input type="text"/>	<input type="text"/>	
Phone		
<input type="text"/>		
Account Manager		
Name *	Email *	
<input type="text"/>	<input type="text"/>	
Phone		
<input type="text"/>		

Figure 1-1 Account Registration Form



Environmental Registry

Ohio River Basin Account Request Notification

Dear John Smith ,

Thank you for applying for an account on Markit Environmental Registry. All accounts are subject to approval. As part of our due diligence procedures, all registry account applicants must provide the following documentation:

- A copy of the organizational certificate, such as the Articles of Incorporation or Company Certificate. This certificate must include the organization registration number, registered office address, and a list of the names of all directors.
- If the registry Account Manager is not named as a company officer in the organizational certificate, a company officer of the applicant organization is required to submit a letter (on company letterhead) stating that the person nominated as the registry Account Manager has been duly appointed and is authorized to accept the Registry Terms of Use and any modification on behalf of the applicant organization.

IMPORTANT: Your application is not complete and cannot be processed until this documentation is received.

The following is a copy of the information we have received for the new Ohio River Basin account application:

Organization Details:

Registered Name: TEST SWCD ACCOUNT V2.4
08202013
Trading Name: TEST SWCD ACCOUNT V2.4
08202013
Classification: Corporate (Medium to Large)
Tax/VAT No.: 12345
Address: 123 some street

State / Province: OH

Main Contact Details:

Name: John Smith
Email: liza.loqounova@markit.com
Phone: 12345

Billing Contact Details:

Name: John Smith
Email: liza.loqounova@markit.com

Figure 1-2 Confirmation Email



Environmental Registry

Pending Account Notification - Request for Identification Document

Dear John Smith ,

As part of our due diligence procedures, all registry account applicants must provide the following personal identification documentation:

- A copy of the registry Account Manager government-issued photo ID (such as a Passport or National Identity Card). The document must include his or her full name, country of residence, and place of and date of birth.

All required documentation must be uploaded directly to your registry's Pending Account.

If you have any questions about the registry account application process, you may reach Markit Operations team via email at environmental@markit.com.

Regards,

Markit Environmental Registry Operations Team

Markit Environmental Registry
620 8th Ave., 35th Floor
New York, NY 10018
Phone: +1 (212) 205-1200
environmental@markit.com
www.markitenvironmental.com

Figure 1-3 requesting Identification Documents

Account Registration

Markit provides an efficient and straightforward account registration and management process. ORB Project participants can click a link to the customized account registration page. This page includes details on the steps for requesting an ORB Project account (Figure 1-1). The account registration page features a list of fields and drop-downs for account information capture, including instructions to easily guide the client on how to open an account with the Markit Environmental Registry.

Once a prospective user inputs all relevant account information, they would be required to accept Markit's Registry Terms and Conditions. This would be done electronically via a tick-box at the end of the form. At this point in the process, a confirmation page would display and an automated confirmation email would be sent to the account contact's email address, as well as the Registry Administrator User (Figure 1-2). The automated confirmation email will contain the list of documents that the client is required to send to registry administrators:

- Articles of Incorporation or
- Articles of Formation or
- Certificate of Limited Partnership or
- Bylaws

Once documentation is verified and approved, a client's account is approved and is set up with limited permissions in the Registry. The Registry Account Manager and each approved user of the account must upload their government-issued photo ID into the registry. (Figure 1-3):

- A copy of the Registry Account Manager government-issued photo ID (such as a Passport or National Identity Card). The document must include client's full name, country of residence, and place of and date of birth.

Personal documents would solely be accessible by a restricted list of Markit Registry staff, who would review them and, if approved, each user will be given access to the Registry and will then be able to perform actions according to his or her permissions level.

Users and Roles (Permission levels)

Verifier (State Agricultural Agency)

This is a unique role that was created specifically for ORB Project.

User, assigned to this role, is able to review submitted issuances and pending issuance listings with all of the submitted supporting documentation and upload Verification Reports.

Regulatory Authority (EPA or State Permitting Authority)

This is a unique role that was created specifically for ORB Project.

User, assigned to this role, is able to review submitted issuances and pending issuance listings with all of the submitted supporting documentation and upload Regulatory Certification Reports.

Manager

The Registry has a unique third-party reviewer/regulator role allowing for the user to view all Registry data related to their specific standard. Within the Registry, users of this type have the ability to be first approval level for account opening, registration of projects, issuance of credits and transfer approval. Additionally, the Regulator would be able to access all project data and permissioned documents for their standards.

For ORB Project this role will be played by EPRI (Electric Power Research Institute).

User, assigned to this role, is able to review submitted projects, issuances and pending issuance listings with all of the submitted supporting documentation and upload Credit Suspension/Cancellation Forms.

Markit administrators

This Markit Administrator role provides the maximum amount of functionality to a user in the Registry. A Markit Administrator is able to view and modify all account holder, project, and issuance information and documentation. This user can approve, reject and deactivate accounts; register, progress and deactivate projects; and activate issuances in accordance with procedures put together with EPRI. This user also has the ability to view reporting for all account, project event, and project management activities. Markit serves in the Markit Administrator role for this new program.

General account holders

Account Holder: General account holder users are be able to register and manage projects and issuances; edit project information; upload documents; check project status; transfer, accept delivery of and retire credits; and view the user's own activity log. This user role is the role that a majority of market participants will be assigned to.

Read Only Account Holder: This role would allow a user to view an account's projects, issuances, holdings, retirements and activity log, without being able to take any actions. Some master account holders assign read-only users to representatives within their organizations. These read-only users can be staff members who wish to be able to access the account but who are restricted by corporate requirements or for other reasons from transacting credits within the account.

During the initial pilot period of the program, EPRI will be acting on behalf of the General Account holders, submitting projects and initiating pending issuance unit listings and verified units issuance.

2 PUBLIC ACCESS TO INFORMATION



Ohio River Basin - Water Quality Trading Project

Clear Search:

Account Holders	Projects	Issuances / Listings	Holdings	Retired Credits					
Project Name	Project Type	Project Start Date	Start Date of Construction	State / Province	Watershed (HUC 4)	Sub-Watershed (HUC 10)	BMP	Details	
Apr2 ORB Project 1	Phosphorus Reduction	02 Apr 2013	24 Apr 2013	test	Muskingum	Headwaters Black Fork Mohican River	Cover Crop	View	
Apr2 ORB Project 1	Nitrogen Reduction	03 Apr 2013	30 Apr 2013	34324	Scioto	Camp Creek-Scioto River	Heavy Use Area	View	
MEMBER 2511	Nitrogen Reduction	20 Mar 2013					Market	View	

Figure 2-1 Customized Public View

ORB Project customized read-only public view will be available for general public. Public users of this page would be able to view and search across a multitude of data and attributes related to account, project and issuance data, including items such as project ID. In addition, they can view public documents related to registered projects, issued credits, and retirements. Retirements are displayed with the account holder, retirement date and any retirement remarks made by the retiring party.

Public view will only display projects, issuances, holding and retirement registered under ORB Project (Figure 2-1).

3 REGISTRY SECURITY

Unified log-in

Standard set of features includes:

- Requires unique user IDs and passwords
- Evaluates password strength and only permits passwords that attain required strength
- Identifies multiple attempts to log in
- Prevents automatic log-in by computer “bots” using the CAPTCHA mechanism
- Rejection of previously used passwords
- Firewalls provide encrypted access to users as required by application

Registry-level security

- Know-Your-Customer checks are made against all Registry customers
- Only Markit Client Services and approved Registry Operations teams are entitled to manage account creation, ownership, users and user entitlements
- Two levels of authentication are available each time a customer logs in to the Registry:
 - Either the physical location of the customer’s computer is authenticated (IP address verification)
 - Or customer’s physical device is authenticated using a two-factor authentication method – A message is sent by a secure, encrypted SMS gateway to the cell phone of the customer as verified by Customer Support, which the customer then submits to the Registry website.
- Once a user has logged in, the user’s browser is tied to the user’s physical device, similar to online banking. The expiration of this connection is configurable in the Registry by Markit Administrator users.

Sub-Registry level access

- Accounts can be restricted by activity type (e.g., transfers, retirements, ability to participate in auctions, etc.)
- User roles are also configurable by Markit Environmental Operations (e.g., read-only, conduct transactions, approve transactions, etc.)
- The Registry is divided into two sections, one with normal Registry-level access and one with enhanced Registry access. Enhanced Registry access is required for all transfer and transaction activities, excluding retirements.
- For enhanced Registry access, each time a transaction session begins, the user must re-satisfy the Registry-level authentication as described in the above section.

4 PROJECT REGISTRATION

Ohio River Basin Water Quality Interstate Trading Program - Project Details

Account Name*: TEST ACCOUNT ORB 001
 Project Name*:
 Project Status: Draft
 Project Description*:

Project Activities

Category*	Standard*	Project Type*	Contract Start Date *	Contract End Date *	Installation Date
<input checked="" type="checkbox"/> Water Quality	Ohio River Basin Water Quality Int...	Nitrogen Reduction	03 Apr 2013	03 Apr 2013	

Additional Info Site Detail Document

Visibility: make project visible to the public once entered into the Market Environmental Registry

Save as Draft Cancel

Figure 4-1 Projects Form

Ohio River Basin Water Quality Interstate Trading Program - Project Details

Account Name*: TEST SWCD ACCOUNT V2.4 001
 Project Name*: TEST S
 Project Status: Draft
 Project Description*: TEST SWCD PROJECT V2.4 08202013 002

Upload Project Additional Information

Nutrient Type*: Nitrogen
 Calculation Methodology*: EPA Region 5 Model
 Best Management Practice*:
 Ancillary Benefits:

- Choose One...
- Gully Stabilization: Grade Stabilization Structure
- Gully Stabilization: Grassed Waterway
- Gully Stabilization: Critical Area Planting in areas ...
- Gully Stabilization: Water and Sediment Control ...
- Bank Stabilization: Animal Trails and Walkways
- Bank Stabilization: Stream Channel Stabilization
- Bank Stabilization: Streambank Protection
- Agricultural Fields: Prescribed Grazing
- Agricultural Fields: Residue Management, Mulch ...
- Agricultural Fields: Conservation Crop Rotation
- Agricultural Fields: Conservation Cover
- Agricultural Fields: Cover and Green Manure
- Agricultural Fields: Critical Area Planting
- Agricultural Fields: Stripcropping, Contour

Additional Info Site Detail Document

Visibility: make project visible to the public once entered into the Market Environmental Registry

Save as Draft Cancel

Figure 4-2 Additional Information form

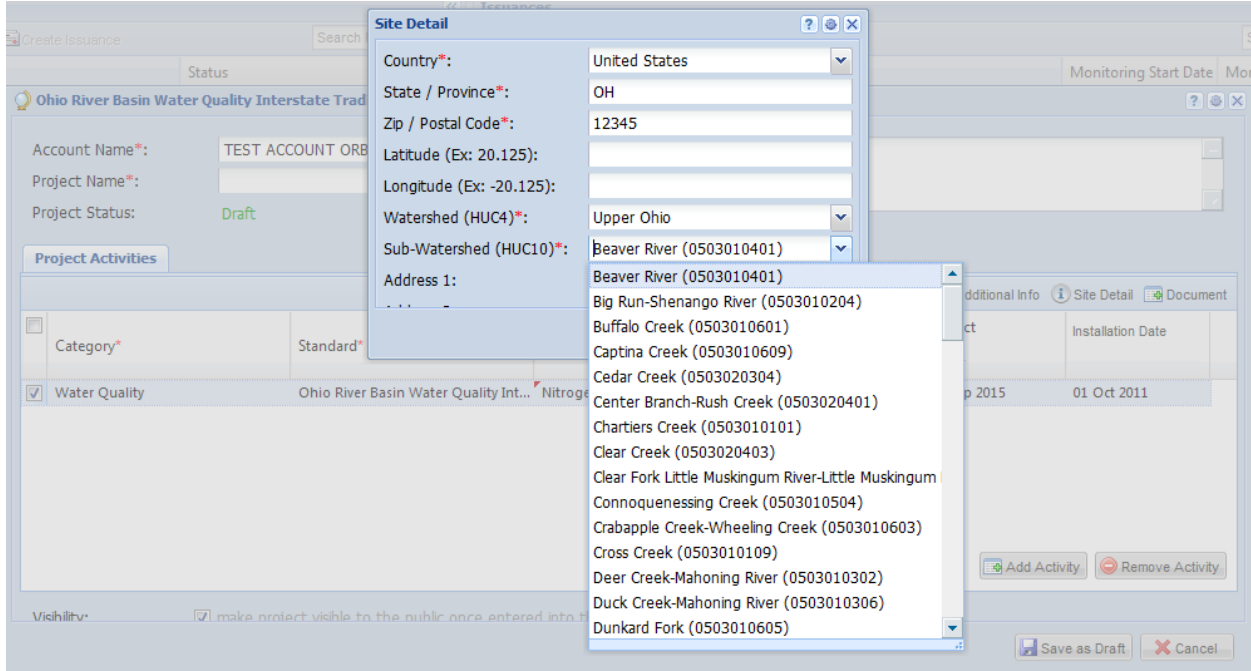


Figure 4-3 Site Details

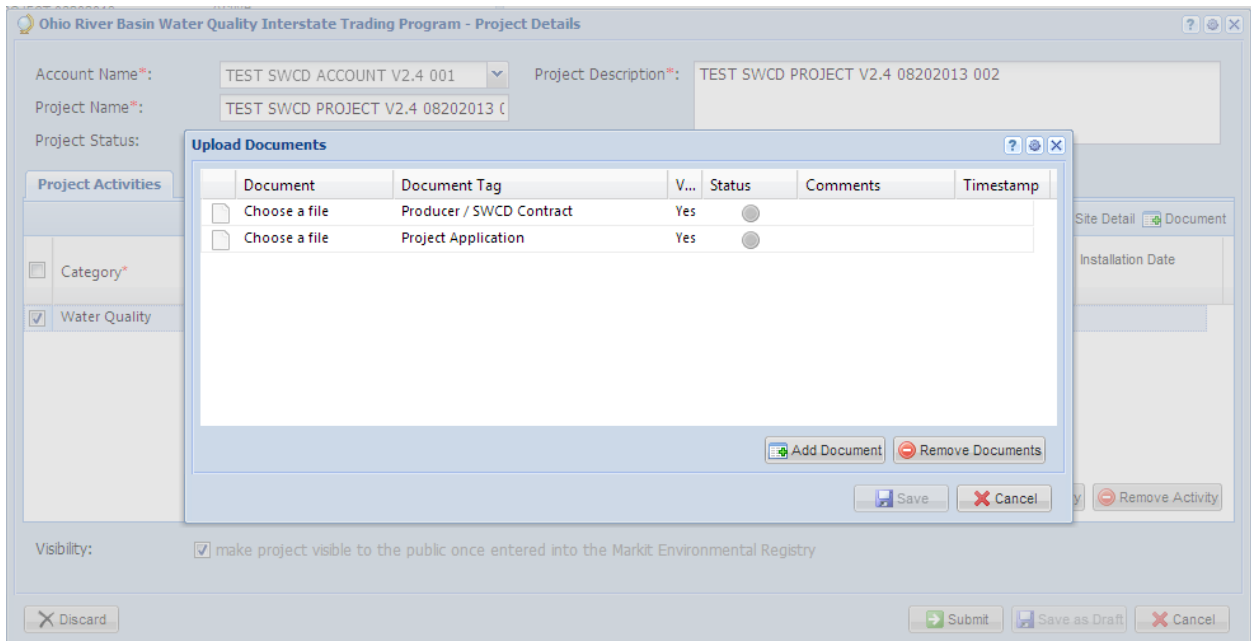


Figure 4-4 Documents Form

Project registration on the Registry is a straightforward and intuitive process. All projects within the Registry are composed of any number of “activities” to allow for maximum flexibility. These activities capture information such as asset category, project scope, project start and end dates (Figure 4-1).

Standard projects are registered using a “New project” button in the Registry. The project registration page opens as a dynamic window with specific fields populated based on information input by the user or information as required by ORB standard. Saving the project creates a draft project within the Registry that can be revised at any point. The user inputs the project name and project description within the window and adds the requisite number of activities, which are normally credit issuances. Within each project activity, the user selects fields such as category, project type, contract start, contract end and installation dates. Additional project information is entered within the “Additional Info” window (Figure 4-2). The fields captured in this window are automatically configured for ORB Project:

- Nutrient Type (Nitrogen or Phosphorus)
- Best Management Practice
 - Gully Stabilization: Grade Stabilization Structure
 - Gully Stabilization: Grassed Waterway
 - Gully Stabilization: Critical Area Planting in areas with gullies
 - Gully Stabilization: Water and Sediment Control Basins
 - Bank Stabilization: Animal Trails and Walkways
 - Bank Stabilization: Stream Channel Stabilization
 - Bank Stabilization: Streambank Protection
 - Agricultural Fields: Prescribed Grazing
 - Agricultural Fields: Residue Management, Mulch Till
 - Agricultural Fields: Conservation Crop Rotation
 - Agricultural Fields: Conservation Cover
 - Agricultural Fields: Cover and Green Manure
 - Agricultural Fields: Critical Area Planting
 - Agricultural Fields: Stripcropping, Contour
 - Agricultural Fields: Stripcropping, Field
 - Agricultural Fields: Filter Strips
 - Feedlot: Runoff Management System
 - Feedlot: Diversion
 - Feedlot: Terrace
 - Feedlot: Waste Management System
 - Feedlot: Waste Storage Facility
 - Feedlot: Solids Separation Basin
 - Feedlot: Solids Separation Basin w/ Infilt. Bed
- Calculation Methodology (EPA Region 5 Model)
- Potential Ancillary Benefits (multiple selections allowed):
 - Carbon sequestration
 - Water quantity
 - Habitat enhancement
 - Excessive run-off
 - Soil health and erosion
 - Fertilizer use reduction
 - Rare species
 - Agriculture viability

-
- Pollinator habitat
 - Other

Information related to a project's location is entered through the "Site Detail" button (Figure 4-3). This window allows the user to enter location information, such as:

- Country
- State
- Zip Code
- HUC 4 (Pre-populated with all participating Watersheds)
- HUC 10 (Pre-filtered list of Sub-Watersheds , based on entered Watershed name)

When a project is first submitted, project changes status to "Pending Review (3rd Party)" and request to review project is send to Electric Power Research Institute program coordinator. Once EPRI program coordinator reviews the project and clicks on "Approve" button, project will be listed with a status of "Pending Review (Markit)". This status signifies that the project is not yet reviewed by Markit Operations Staff member. Once Markit Operations team member reviews the project according to the agreed upon operational procedures, project will change status to "Active".

As it relates to project and issuance related document management, the Registry provides simple document-upload functionality so that all stakeholders can upload documents to the Registry. Documents can be attached at either the project or issuance level to allow for clear classification of the document's purpose (Figure 4-4). Pressing a "Document" button on a project record screen will display all documents currently uploaded, in addition to document tags for documents that may be required but had not yet been uploaded. The Registry is configured to display the list of documents that are required by the ORB standard in order to advance the project to the next project registration stage:

- Project Application

Once a document is uploaded, the user will have the ability to select the document's visibility using a drop-down menu as public or private, as well as the document type (application, credit release letter, etc). Upload of any documents will notify Markit Administrators that an upload has occurred. Most standards require all documents to be public except those containing commercially sensitive information, such as the communications agreement or proof of right. ORB has the ability to set the requirement either per project or for all of the projects operating under its standard.

Current requirement from the ORB Project administrator is to set Project Application as private documents as it contains personal information and sensitive information.

When a project is deactivated or removed, it still remains within the system. Discarded projects would no longer be visible to Registry users, except for Markit Administrators.

5 NUTRIENT CREDIT ISSUANCE

Ohio River Basin Water Quality Interstate Trading Program - Issuance Details

Account Name*: DEMO INDIANA STATE COUNTY SWCD Project Name*: IN-115-2013-110 - Training

Issuance Requested Date: 17 Oct 2013 Status: Active

Issuance Date: 17 Oct 2013

Monitoring Period
Start date: End date: Add Monitoring Period

01/10/2012 - 30/09/2013

Project Activity	Vintage Start*	Vintage End*	Quantity*	Verifier	Regulatory Authority	Class*
Ohio River Basin Water Quality Intersta...	01 Oct 2012	30 Sep 2013	90	Indiana State Department...	Indiana Department Of E...	UNIT
Ohio River Basin Water Quality Intersta...	01 Oct 2012	30 Sep 2013	90	Indiana State Department...	Indiana Department Of E...	UNIT
Ohio River Basin Water Quality Intersta...	01 Oct 2012	30 Sep 2013	43	Indiana State Department...	Indiana Department Of E...	RESERVE
Ohio River Basin Water Quality Intersta...	01 Oct 2012	30 Sep 2013	10	Indiana State Department...	Indiana Department Of E...	RESERVE
Ohio River Basin Water Quality Intersta...	01 Oct 2012	30 Sep 2013	387	Indiana State Department...	Indiana Department Of E...	UNIT

Buttons: Discard, Add Issuance, Remove Issuance, Submit, Save, Cancel

Figure 5-1 Issuance Form – issuing verified units

Ohio River Basin Water Quality Interstate Trading Program - Issuance Details

Account Name*: DEMO INDIANA STATE COUNTY SWCD Project Name*: IN-115-2013-110 - Training

Issuance Requested Date: 17 Oct 2013 Status: Active

Issuance Date: 17 Oct 2013

Monitoring Period
Start date: End date: Add Monitoring Period

01/10/2012 - 30/09/2013

Upload Documents

Document	Document Tag	V...	Status	Comments	Timestamp
Choose a file	SWCD Installation Report	Yes	●		
Choose a file	Credit Release Letter	Yes	●		
Credit_Calculation_...	Credit Calculation Report	Yes	●		17 Oct 201...
Credit_Certification_...	Regulatory Certification Report	Yes	●		17 Oct 201...
Pike_Island.xls	Verification Report	Yes	●		17 Oct 201...
TEST_DOC_1.docx	Project Application	No	●		06 Jan 201...
TEST_DOC_2.docx	Producer / SWCD Contract	No	●		06 Jan 201...

Buttons: Add Document, Remove Documents, Save, Cancel

Figure 5-2 Issuance Documents



Figure 5-3 First Year Verified Units issuance flow

Ohio River Basin Water Quality Interstate Trading Program - Issuance Details

Account Name*: DEMO OHIO STATE COUNTY SWCD Project Name*: OH-111-2013-111 - Training

Issuance Requested Date: 18 Nov 2013 Status: Pending Review (Verifier)

Issuance Date: [Empty]

Monitoring Period

Start date: [Empty] End date: [Empty] Add Monitoring Period

01/12/2014 - 30/11/2015

Project Activity	Vintage Start*	Vintage End*	Quantity*	Verifier	Regulatory Authority	Class*	Me
Ohio River Basin Water Quality Interstate Tr...	01 Dec 2014	30 Nov 2015	1,000	Ohio Department of Natural...	Ohio EPA	PIU	TN
Ohio River Basin Water Quality Interstate Tr...	01 Dec 2014	30 Nov 2015	1,000	Ohio Department of Natural...	Ohio EPA	PIU	TP

Submit Save Cancel

Figure 5-4 Issuance Form – listing PIU credits

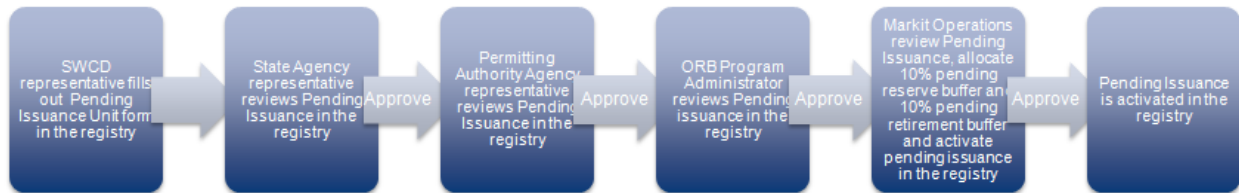


Figure 5-5 Subsequent Years credit listing flow

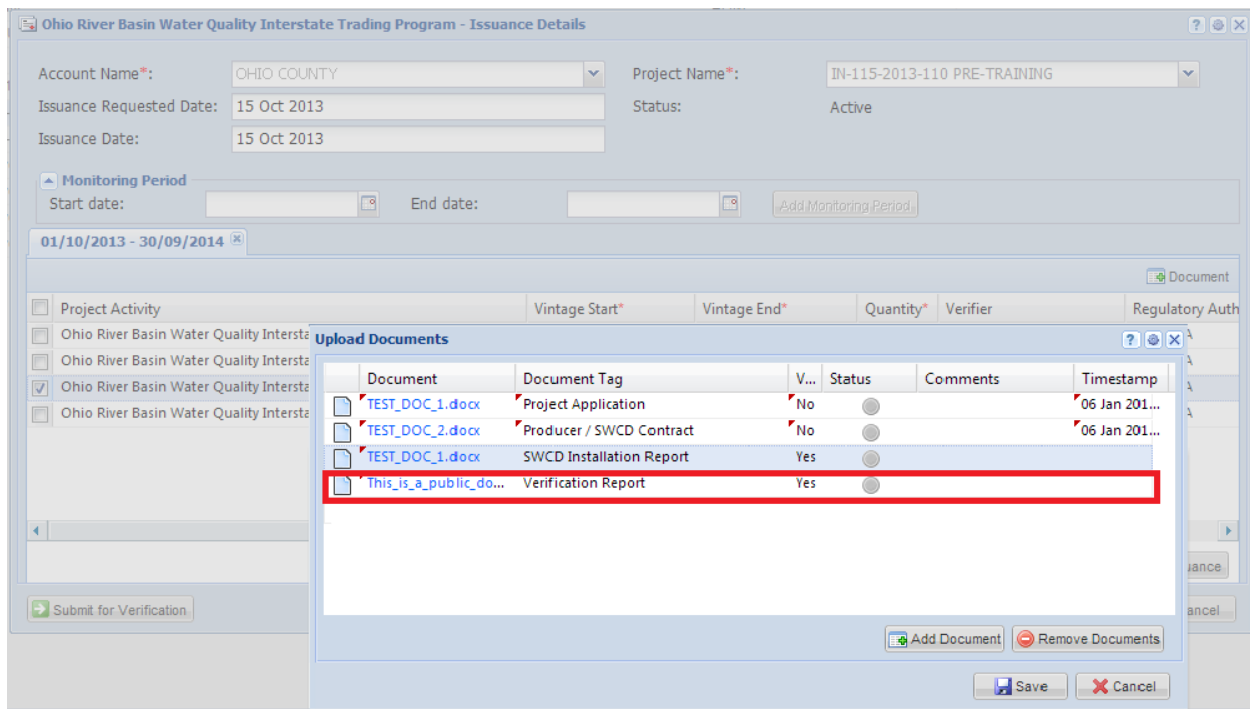


Figure 5-6 submitting PIUs for verification

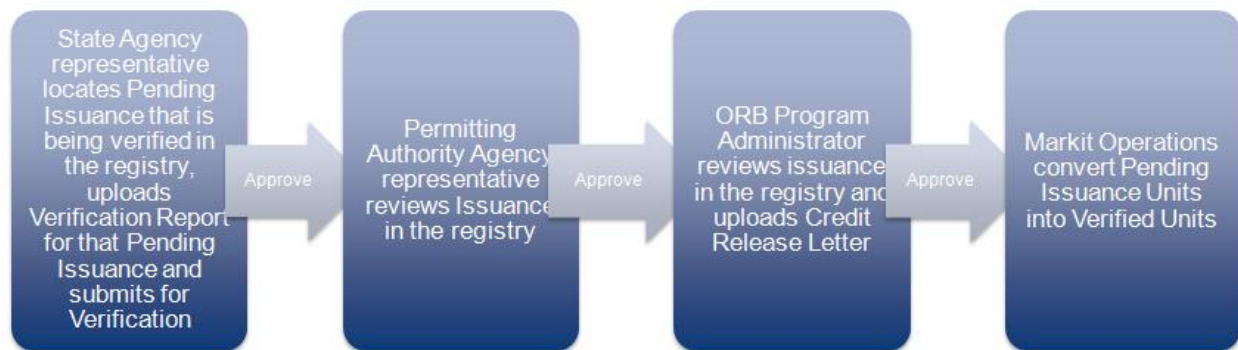


Figure 5-7 PIU Verification flow

The Registry contains dynamic issuance functionality that can be used to provide state-of-the-art capabilities to the ORB Project. The Registry is able to issue multiple credit types:

- Units (for verified units)
- Reserve (units issued into buffer accounts)
- PIU (Pending Issuance Units, i.e. projected units for the upcoming water years)
- PIU Reserve (Pending Issuance Units, i.e. projected units for the upcoming water years issued into buffer accounts)

The system will automatically generate serial numbers in the format agreed with the standard. Project developers will be able to hold credits in their account and then retire them as necessary.

Nutrient Credit issuance – Recording Verified Units

When project developer wishes to begin the Nutrient Credit issuance process, he or she would press a “Create Issuance” button to begin entering issuance details (Figure 5-1). The issuance window would first prompt the user to define the monitoring period.

For the first year of Verified Units, user will input monitoring period for that first water year. The Registry will then create a tab for that monitoring period input by the user.

Within this monitoring period, the user will specify

- Project activity against which the credits are being issued and the credit type (cover crops, heavy use area, etc)
- Vintage (water years) for the verified units for the first year
- Quantity requested
- Verifier (State Agency that will be verifying issued units)
- Regulatory Authority (EPA agency that will be providing regulatory certification report)
- Unit Class (Verified Unit)
- Measurement (Total Nitrogen lbs/year, Total Phosphorus lbs/year)
- Public visibility (Public or Private)

Similar to the project registration process, the user can attach all documents through the “Document” button in the issuance window. The following documents will be automatically displayed as required (Figure 5-2):

- Project Application (uploaded by project developer)
- SWCD Installation Report (uploaded by project developer)
- Credit Calculation Report (uploaded by project developer)
- Verification Report (uploaded by Verifier (State Agency), during issuance approval process)
- Regulatory Certification Report (uploaded by Regulatory Authority (EPA), during issuance approval process)
- Credit Release Letter (uploaded by Manager (EPRI), during issuance approval process)

Once the user has input all mandatory fields, he or she can submit the issuance request. At this point the issuance review process commences. Please refer to the flow diagram outlined in Figure 5-3.

Issuance first will change status to “Pending Review (Verifier)” and request to review issuance will be sent to the appropriate State Agency:

- Ohio Department of Natural Resources
- Indiana State Department of Agriculture
- Kentucky Department of Natural Resources

State Agency will receive email notification, requesting them to review and approve issuance.

Upon approval, State agency will upload Verification report for these Verified Credits and will press on “Approve” button.

Subsequently, issuance will change status to “Pending Review (Regulatory Authority)” and request to review issuance will be sent to the appropriate Regulatory Authority:

- Ohio EPA

- Indiana Department Of Environmental Management (IDEM)
- Kentucky Department of Environmental Protection

Appropriate Regulatory Authority will receive email notification, requesting them to review and approve issuance. Upon approval, they will upload Regulatory Certification Report for these Verified Credits and will press “Approve” or “Reject” credits.

At this point, status changes to “Pending Review (3rd Party)”. Electric Power Research Institute is prompted to review issuance, receiving email notification.

Once EPRI program coordinator reviews the project, uploads Credit Release Letter and clicks on “Approve” button or the “Reject” button, issuance changes status to “Pending Review (Markit)”.

This status signifies that the issuance is not yet reviewed by Markit Operations Staff member. Once Markit Operations team member reviews the issuance according to the agreed upon operational procedures, allocates 10% of the submitted quantity as a RESERVE amount and presses “Approve” button or the “Reject” button.

At this point, if the issuance was approved, it is activated and will change status to “Active”. If projects or specific units are Rejected, the project is kicked back to the prior approval step.

Upon Nutrient credit issuance, the Registry will automatically generate serial numbers and assign them to the issuances. In cases of error and as agreed with the program administrator, the Markit Administrator has the ability to cancel an issuance and re-issue the credits through a streamlined workflow. As is noted in the Users section, all of the Markit Administrator capabilities are already in place within the Registry. Markit credit serial numbers will contain reference to project elements from the ORB Project standard.

An example serial number is below:

ORB-BAW-US-10000000001275-01122013-30112014-4101-4134-MER-0-P

- ORB refers to the standard: ORB Project
- BAW refers to the environmental category Biodiversity and Water
- US refers to the country: United States
- 100000000055670 refers to the project ID
- 01012010-31122010 refers to the vintage period: Dec 1, 2013 – November 30., 2014
- 4101-4134 refers to the credit block start and block end values
- MER refers to the issuing Registry: Markit
- 0 refers to the number of additional certifications on the credit
- A refers to whether the credits are ex-post (P) or ex-ante (A)

After Issuance is fully activated, Markit Operations User will transfer both Reserve and Active Verified Units to EPRI Holdings account and will retire another 10% of the active units, per EPRI’s voluntary commitment during this period of the project to ensure public benefit.

Nutrient Credit issuance – Listing Pending Issuance Units (PIUs)

Each Pending Issuance Unit (PIU) represents an anticipated environmental credit to be delivered based on a specified standard-compliant project validation report. These anticipated units can be listed, serialized, held and tracked on the Markit Registry.

ORB Project is utilizing this Registry concept to track anticipated nitrogen and phosphorous reductions for future vintage periods.

When a project developer wishes to begin the Nutrient Credit PIU listing process, he or she would press “Create Issuance” button to begin entering PIU details (Figure 5-4). The issuance window would first prompt the user to define the monitoring period.

For the second, third, fourth and fifth year of PIUs, user will input monitoring period for that particular water year. The Registry will then create a tab for that monitoring period. Within this monitoring period, the user will specify

- Project activity against which the PIUs are being listed and the credit type
- Vintage (water years) for the PIUs
- Quantity requested
- Verifier (State Agency that will be verifying issued units)
- Regulatory Authority (EPA agency that will be providing regulatory certification report)
- Unit Class (PIU)
- Measurement (Total Nitrogen lbs/year, Total Phosphorus lbs/year)
- Public visibility

Similar to the verified units’ issuance process, the user can attach all documents through the “Document” button in the issuance window. The following documents will be automatically displayed as required (Figure 5-2):

- Project Application (uploaded by project developer)
- SWCD Installation Report (uploaded by project developer)
- Credit Calculation Report (uploaded by project developer)
- Verification Report (uploaded by Verifier (State Agency), during PIU approval process)

Once the user has input all mandatory fields, he or she can submit the PIU listing request. At this point PIU listing review process commences. Please refer to the flow diagram outlined in Figure 5-5.

Issuance first will change status to “Pending Review (Verifier)” and request to review listing will be sent to the appropriate State Agriculture Agency:

- Ohio Department of Natural Resources
- Indiana State Department of Agriculture
- Kentucky Department of Natural Resources

State Agency will receive email notification, requesting them to review and approve listing.

Upon approval, State Agriculture agency will upload Verification report that will include anticipated reductions (they will be outlined in Annual Credits Contracted columns for future vintage years) and will press on “Approve” button.

Subsequently, listing will change status to “Pending Review (Regulatory Authority)” and request to review issuance will be sent to the appropriate Regulatory Authority:

- Ohio EPA
- Indiana Department of Environmental Management (IDEM)
- Kentucky Department of Environmental Protection

Appropriate State Regulatory Agency will receive email notification, requesting them to review and approve listing.

Upon approval, appropriate Agency will press on “Approve” button or the reject button, appropriately. This agency is not required to upload any supporting documentation at this point in time.

At this point, status changes to “Pending Review (3rd Party)”. Electric Power Research Institute is prompted to review listing, receiving email notification.

Once EPRI program coordinator reviews listings and clicks on “Approve” button, listing changes status to “Pending Review (Markit)”.

This status signifies that the listing is not yet reviewed by Markit Operations Staff member. Once Markit Operations team member reviews the listing according to the agreed upon operational procedures, allocates 10% of the submitted quantity as a PIU RESERVE amount and presses “Approve” button.

At this point listing is activated and will change status to “Active”.

Upon Nutrient PIU listing, the Registry will automatically generate serial numbers and assign them to the listings. Please refer to section above for serial number generation process.

After listing is fully activated, Markit Operations User will transfer both Reserve and Active PIUs to EPRI Holdings account and will transfer another 10% of the active PIUs into EPRI’s Pending Retirement account.

If at any point units are Rejected, they are move back to the prior step in the issuance flow.

Verifying PIUs

At the end of every vintage year (December 1 – November 30), State Agencies will be required to provide updated verification report for the reductions that occurred during this period of time and that were recorded as anticipated nutrient reductions previously.

State Agriculture Agency representative will navigate to the Registry and will initiate Verification process in the Registry by opening up appropriate PIU listings issuance form, uploading updated Verification report and clicking on the “Submit for Verification” button. (Figure 5-5).

At this point PIU listing review process commences. Please refer to the flow diagram outlined in Figure 5-5.

Listing will change status to “Pending Verification Review (Regulatory Authority)” and request to review issuance will be sent to the appropriate Regulatory Authority:

- Ohio EPA
- Indiana Department Of Environmental Management (IDEM)
- Kentucky Department of Environmental Protection

Appropriate Environmental Protection Agency will receive email notification, requesting them to review verification report that was submitted and approved verification of PIUs.

Upon approval, appropriate Environmental Protection Agency will press on “Approve” button or “Reject” button appropriately. This agency is not required to upload any supporting documentation at this time.

At this point, status changes to “Pending Review (3rd Party)”. Electric Power Research Institute is prompted to review verification of PIUs and upload Credit Release Letter.

Once EPRI program coordinator reviews verification report, uploads Credit release Letter and clicks on “Approve” button, listing changes status to “Pending Verification Review (Markit)”.

This status signifies that the PIUs verification is not yet reviewed by Markit Operations Staff member.

Markit Operations team member reviews the verification according to the agreed upon operational procedures, converts PIU quantities according to the verified quantities outlined in the Credit Release Letter and presses “Approve” button.

At this point PIUs are converted to Verified Units and issuance changes status to “Active”.

Markit Operations User will also retire all converted credits from the EPRI Pending Retirement Account.

At any point, units that are rejected will move back to the prior step in the flow.

Cancelling PIUs

In case not all 100% of PIUs are verified, EPRI will upload Credit Suspension/cancellation form, specifying amount of suspended credits.

Markit Operations team will mark suspended PIUs as “Not verified” and these credits will be removed from circulation.

6 RFI PLATFORM – EXTENDING FOR BUYERS

markit Welcome, Mer Test10 Support

My Account Summary Manage My Units My Projects and Issuances **RFI** Bids/Offers User Admin Reports Activity Log Admin Registry

Offers (Sell) Bids (Buy) Attenuation Tool

Offers (Sell)

Ohio River Basin Water Quality Interstate Trading Program Search RFIs...

Location Information

Enter HUC 10 Location N/A Submit

Open Respond Unlist Transfer Enter Offer (Sell) Export to Excel Export to PDF

Type of ...	Additional Inf...	Listed Dat...	Project Type	Vintage	Seller Qu...	Measurement	Unit Class	Seller Price	Attenuation Factor	My Quantity	My Price	My Cost	M...
Offer (Sell)		23 Apr 2012	Phosphorus reduction/removal	2010 - 20...	4,323	lbs/year	UNIT	5.6	0.00	4,323.00	5.60	24,208.80	<input type="checkbox"/>
Offer (Sell)		04 Sep 2012	Phosphorus reduction/removal	2010 - 20...	50,000	lbs/year	UNIT	5.89	0.00	50,000.00	5.89	294,500.00	<input type="checkbox"/>
Offer (Sell)		08 May 2013	Phosphorus Reduction	2014	45	TP lbs/year	CERTIFIED	4.5	0.00	45.00	4.50	202.50	<input type="checkbox"/>
Offer (Sell)		22 Jul 2013	Nitrogen Reduction	2013 - 20...	1	TN lbs/year	UNIT	1	0.00	1.00	1.00	1.00	<input type="checkbox"/>
Offer (Sell)		22 Jul 2013	Nitrogen Reduction	2013 - 20...	1	TN lbs/year	UNIT	1	0.00	1.00	1.00	1.00	<input type="checkbox"/>
Offer (Sell)		22 Jul 2013	Nitrogen Reduction	2013 - 20...	1	TN lbs/year	UNIT	1	0.00	1.00	1.00	1.00	<input type="checkbox"/>
Offer (Sell)		22 Jul 2013	Nitrogen Reduction	2013 - 20...	1	TN lbs/year	UNIT	1	0.00	1.00	1.00	1.00	<input type="checkbox"/>

Figure 6-1 RFI platform – Offers (Sell) tab

markit Welcome, Test User16 Support

My Account Summary Manage My Units My Projects and Issuances **RFI** Request for Information Registry

Find Units By More Options Show All Units

Project Account Search...

Name

- DEMO INDIANA STATE COUNTY SWCD
- DEMO KENTUCKY STATE COUNTY SW...
- DEMO OHIO STATE COUNTY SWCD
- TEST ACCOUNT ORB V2.6
- Test EPRI Holdings Account
- TEST EPRI Pending Retirement Account

Transfer List Retire Convert Dis

Project RFI

- IN-115-2 Exchange
- IN-115-2 Spot Auction
- Ohio ORB Second Round Spot Auction
- IN-115-2 Forward Auction
- Ohio ORB Second Round Forward Auction
- IN-115-2013-110 - Training
- Ohio River Basin Water Quality Interstate Trading Pro ORB-BAW-US-103000000005586-01122013-30112014-
- IN-115-2013-110 - Training
- Ohio River Basin Water Quality Interstate Trading Pro ORB-BAW-US-103000000005586-01122013-30112014-
- KY-1111-2013-1111 - Training
- Ohio River Basin Water Quality Interstate Trading Pro ORB-BAW-US-103000000005586-01122013-30112014-
- KY-1111-2013-1111 - Training
- Ohio River Basin Water Quality Interstate Trading Pro ORB-BAW-US-103000000005586-01122013-30112014-

RFI Details:

Date Listed: 02 Jan 2014

Price/Unit: US Dollar

Quantity: 900

Status: New

Unit Details

Country / Year	Amount	Measure
United States - 2014	900	TN lbs/year (PIU)
Ohio River Basin Water Quality Interstate Trading Program - Nitrogen Reduction		

Total: 900 Units

Submit Cancel

Serial no. Public Visibi... Status

No	Active
No	Active
No	Active
No	Active
No	Active
No	Active

Figure 6-2 RFI platform – Enter Offer (Sell) form

The screenshot shows the 'Bids (Buy)' tab in the Markit RFI platform. The interface includes a search bar for RFI IDs and a 'Location Information' section with a dropdown for 'Enter HUC 10 Location' and a 'Submit' button. Below this is a table of bids with the following columns: Type of Bid, Additional Information, Listed Date, Project Type, Vintage, Buyer Quantity, Measurement, Unit Class, Buyer Price, Attenuation Factor, My Quantity, My Price, My Total Price, and a checkbox for selection.

Type of Bid	Additional Information	Listed Date	Project Type	Vintage	Buyer Quantity	Measurement	Unit Class	Buyer Price	Attenuation Factor	My Quantity	My Price	My Total Price	M...
Bid (Buy)	Additional Cer...	19 Jul 2013	Nitrogen Reduction	2011	100,000	TN lbs/year	UNIT	2.22	0.00	100,000.00	2.22	222,000.00	<input type="checkbox"/>
Bid (Buy)	Any	22 Jul 2013	Nitrogen Reduction	2013	10,000	TN lbs/year	PIU	10	0.00	10,000.00	10.00	100,000.00	<input type="checkbox"/>
Bid (Buy)	Any	24 Jul 2013	Any		23	Any	UNIT	23	0.00	23.00	23.00	529.00	<input type="checkbox"/>
Bid (Buy)	Water Quantity	26 Jul 2013	Nitrogen Reduction	2014	1,000	TN lbs/year	PIU	5	0.00	1,000.00	5.00	5,000.00	<input type="checkbox"/>
Bid (Buy)	Water Quantity	29 Jul 2013	Nitrogen Reduction	2012	4,500	TN lbs/year	UNIT	34	0.00	4,500.00	34.00	153,000.00	<input type="checkbox"/>
Bid (Buy)	Water Quantity	30 Jul 2013	Any	2019	6,700	TP lbs/year	PIU_RESERVE	34.89	0.00	6,700.00	34.89	233,763.00	<input type="checkbox"/>
Bid (Buy)	Any	30 Jul 2013	Nitrogen Reduction	2017	4,500	TN lbs/year	PIU	5.77	0.00	4,500.00	5.77	25,965.00	<input type="checkbox"/>

Figure 6-3 RFI Platform – Bids (Buy) tab

The screenshot shows the 'Enter Bid (Buy)' form in the Markit RFI platform. The form is titled 'Enter Bid (Buy)' and includes a dropdown for 'Account Name*' set to 'TEST EPRI BuyerAccount'. Below this is a table of bid options with the following columns: Category, Standard, Additional Information (Ancillary Bene...), Project Type, HUC10 Location, Vintage, Quantity, Measurement, Class, and Price. The table contains three rows of bid options.

Category*	Standard	Additional Information (Ancillary Bene...)	Project Type	HUC10 Location	Vintage	Quantity*	Measurement	Class*	Price*
<input checked="" type="checkbox"/>	Water Quality	Ohio River Basi...	Any	Allegheny Reserv...	2015	6000	TN lbs/year	PIU	8.7
<input type="checkbox"/>	Water Quality	Ohio River Basi...	Any	Anderson Fork (0...	2014	5000	TP lbs/year	PIU	4
<input type="checkbox"/>	Water Quality	Ohio River Basi...	Water Quantity	Nitrogen Redu...	2013	10000	TN lbs/year	UNIT	7.5

At the bottom of the form, there are buttons for 'Add Bid (Buy)', 'Remove Bid (Buy)', 'Submit', and 'Cancel'.

Figure 6-4 “Enter Bid” Form

Posting Interest to sell credits

Markit RFI platform already provides functionality to post interests to sell credits (Figure 6-1 and Figure 6-2). ORB Project participants will be able to utilize this functionality to post their credits for sale; currently only EPRI posts credits for sale. As the Project progresses, there is already built functionality for parties to be able to navigate to this page and respond to credit buy offers and to initiate a bilateral transaction.

Posting Interest to buy credits

ORB Project participants are able to post their interest to buy credits on the customized version of Markit Environmental RFI Platform.

Participants will be able to navigate to the Bids (Buy) RFI tab (Figure 6-3) and press on “Enter Bid (Buy)” button. Pressing on this button will bring up the form (Figure 6-4). Utilizing this form, program participants will be able to enter Bid information, specifying the following data elements:

- Category: Water
- Standard: Ohio River Basin Water Quality Interstate Trading Program
- Project Type: Nitrogen Reduction or Phosphorus Reduction
- Vintage: Water Year or range that they are interested in
- Quantity
- Measurement: TN lbs/year or TP lbs/year
- Class: Whether they are interested in PIUs or UNITS (Verified Units)
- Price

Once Participant Submits bid information, new Bid (Buy) line item will show up on the RFI Bids form. Interested parties will be able to navigate to this page and respond to the bid to initiate a bilateral transaction.

7 “TRADING RATIO TOOL”: EMBEDDED ATTENUATION CALCULATOR

In a water quality trading market, a fundamental challenge is understanding, quantifying, and managing the uncertainty associated with the implementation of practices on-the-ground and their associated water quality benefits over time and place. EPRI is advancing a rigorous method for calculating credit trade ratios. Trade ratios account for uncertainty, location, delivery, and equivalence.

The ORB Project is using a scientifically-based credit equation methodology that will account for location-specific nutrient attenuation factors, rather than a blanket trading ratio throughout the entire Ohio River Basin. Attenuation factors are calculated based on the Watershed Analysis Risk Management Framework (WARMF) Watershed Model for Nutrient Trading in the Ohio River Basin (Please refer to Section 12 for publication references).

RFI platform seamlessly incorporates attenuation factors to allow buyers and sellers of water quality credits to easily see attenuated quantity and associated costs and prices of the credits that they would like to purchase or sell. In other words, The RFI “trading ratio tool” seamlessly translates the amount of nitrogen and phosphorus reduction for sale from the point of generation (usually at the “edge of field”) to the amount of reduction at the facility which has the compliance obligation or otherwise another point of interest. The tool also translates the price being offered by the seller to the effective cost of the reduction to the compliance buyers.

Furthermore, once such attenuated trade is performed, the registry will track both the original amount (point of generation amount) and attenuated amount in the buyer’s account. It is essential to track proper attenuated amount, i.e. amount that can be claimed towards the compliance obligation, once program enters into the compliance stage.

RFI Platform with embedded Attenuation Calculator “Trading Ratio Tool” for potential buyers

ORB Project buyers will be able to utilize customized RFI platform with embedded attenuation tool to filter posted Offers (credits for sale) and view calculated attenuated quantities and prices.

Type of L...	Additional Info...	Listed Date	Project Type	Vintage	Seller Qu...	Measurement	Unit Class	Seller Price	Attenuation Factor	My Quantity	My Price	My Cost
Offer (Sell)	Fertilizer Use R...	17 Oct 2013	Nitrogen Reduction	2013	143	TN lbs/year	UNIT	30	0.50	71.50	60.00	4,290.00

Figure 7-1 Attenuation Calculator for the Potential Buyer

Participant buyers will be able to navigate to the RFI tool / Offers (Sell) tab, select their HUC 4 and HUC 10 locations and press on “Submit” button. RFI tool will filter relevant posted offers (credits for sale) based on the entered location, only displaying offers that were generated upstream from the entered location and where attenuation factor exists. RFI grid will display attenuated quantity (“My Quantity” column), price (“My Price” column) and cost (“My Cost”) for the buyer, making it easier for him to make a decision regarding credit purchase (Figure 7-1). The following formulas for calculating attenuated quantities and prices will be utilized:

- *Buyer’s Attenuated Quantity = (Quantity offered by seller *(1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Buyer’s Attenuated Price = (Price specified by seller /(1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Buyer’s Cost = Buyer’s Attenuated Quantity * Buyer’s Attenuated Price*

Buyer will be able to respond to an offer by clicking on “Respond” button and entering quantity that he is interested in purchasing at his location and price per lbs/year that he is willing to buy it at. “Respond” form has a built in calculator that will convert buyer’s quantity and price to the seller, using appropriate attenuation factor (Figure 7-2).

- *Seller’s Attenuated Quantity = (Quantity proposed by buyer /(1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Seller’s Attenuated Price = (Price specified by buyer *(1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Buyer’s Cost = Seller’s Attenuated Quantity * Seller’s Attenuated Price*

Clicking on the “Submit” button on the Response form will generate an email to the account holder associated with the RFI offer listing, which will enable the two parties to discuss the terms of a potential bilateral transaction.

RFI Platform with embedded Attenuation Calculator “Trading Ratio Tool” for potential sellers

ORB Project sellers will be able to utilize customized RFI platform with embedded attenuation tool to filter posted Bids (interest in purchasing credits) and view calculated attenuated quantities

and prices. Currently, EPRI is the only credit seller, however the functionality is created to allow for others to sell credits in the future if that materializes.

Type of Li...	Additional Inf...	Listed Dat...	Project Type	Vintage	Buyer Qu...	Measurement	Unit Class	Buyer Price	Attenuation Factor	My Quantity	My Price	My Total Pr...
Bid (Buy)	Fertilizer Use Red...	17 Oct 2013	Nitrogen Reduction	2013	500	TN lbs/year	UNIT	4	0.42	862.07	2.32	2,000.00
Bid (Buy)	Excessive Run-off	07 Nov 2013	Nitrogen Reduction	2014	500	TN lbs/year	PIU	10	0.00	500.00	10.00	5,000.00
Bid (Buy)	Habitat Enhance...	07 Nov 2013	Nitrogen Reduction	2014	1,000	TN lbs/year	PIU	10	0.50	2,000.00	5.00	10,000.00

Figure 7-2 Attenuation Calculator for the Potential Seller

Participant seller will be able to navigate to the RFI tool / Bids (Buy) tab, select their HUC 4 and HUC 10 locations and press on “Submit” button. RFI tool will filter relevant posted bids (interest in purchasing credits) based on the entered location, only displaying bids that are needed downstream from the entered location and where attenuation factor exists. RFI grid will display attenuated quantity (“My Quantity” column), price (“My Price” column) and total price (“My Total Price”) for the seller, making it easier for him to make a decision regarding the credit sale (Figure 7-3).

The following formulas for calculating attenuated quantities and prices will be utilized:

- *Seller’s Attenuated Quantity = (Quantity proposed by buyer / (1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Seller’s Attenuated Price = (Price specified by buyer * (1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Seller’s Total Price = Seller’s Attenuated Quantity * Seller’s Attenuated Price*

Seller will be able to respond to a bid by clicking on “Respond” button and entering quantity that he is interested in selling at his location and price per lbs/year that he is willing to sell at. “Respond” form has a built in calculator that will convert seller’s quantity and price to the buyer, using appropriate attenuation factor (Figure 2-4).

- *Buyer’s Attenuated Quantity = (Quantity offered by seller * (1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Buyer’s Attenuated Price = (Price specified by seller / (1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Seller’s Total Price = Buyer’s Attenuated Quantity * Buyer’s Attenuated Price*

Clicking on the “Submit” button on the Response form will generate an email to the account holder associated with the RFI bid listing, which will enable the two parties to discuss the terms of a potential bilateral transaction.

markit Welcome, Test User17

My Account Summary Manage My Units My Projects and Issuances **RFI** Bids/Offers User Admin Reports Activity Log Registry

Offers (Sell) Bids (Buy) Attenuation Tool

Offers (Sell)

Ohio River Basin Water Quality Interstate Trading Program Search RFIs...

Location Information
Scioto Indian Run-Scioto River (0506000112) Submit

Open **Respond** Unlist Transfer Enter Offer (Sell) Export to Excel Export to PDF

RFI Notification Details - responding to an offer

From: (Unknown Account)
 To: (Unknown Account)
 Date: 02 Jan 2014 16:31
 Title: Response to offer #100000000013098
 Enter Quantity that you wish to purchase: 500
 Enter Price at which you wish to purchase: 10
 My Cost: 5,000
 Attenuation Factor: 0.5
 Seller's Quantity: 1,000
 Seller's Price: 5
 Interested to buy 500 credits

Submit Cancel

Attenuation Factor	My Quantity	My Price	My Cost
50	71.50	60.00	4,290.00

Figure 7-3 "Respond to an offer" form

markit Welcome, Test User16

My Account Summary Manage My Units My Projects and Issuances **RFI** Bids/Offers User Admin Reports Activity Log Registry

Offers (Sell) **Bids (Buy)** Attenuation Tool

Bids (Buy)

Ohio River Basin Water Quality Interstate Trading Program Search RFIs...

Location Information
Scioto Headwaters Scioto River (0508000101) Submit

Open **Respond** Unlist Transfer Enter Bid (Buy)

RFI Notification Details - responding to a bid

From: (Unknown Account)
 To: (Unknown Account)
 Date: 02 Jan 2014 16:33
 Title: Response to bid #100000000013196
 Enter Quantity that you wish to sell: 4,000
 Enter Price at which you wish to sell: 10
 My Total Price: 40,000
 Attenuation Factor: 0.5
 Buyer's Quantity: 2,000
 Buyer's Price: 20
 Interested to sell 4,000 credits

Submit Cancel

Attenuation Factor	My Quantity	My Price	My Total Pr...
42	862.07	2.32	2,000.00
00	500.00	10.00	5,000.00
50	2,000.00	5.00	10,000.00

Figure 7-4 "Respond to a bid" form

8 “WHAT-IF” ATTENUATION CALCULATOR

markit

Welcome, Test User16

My Account Summary Manage My Units My Projects and Issuances RFI Bids/Offers User Admin Reports Activity Log Registry

Offers (Sell) Bid (Buy) **Attenuation Tool**

Entry Point for Generation Quantity*:

Quantity At Destination:

Project Type*:

Entry Point for generation Price*:

Price At Destination:

HUC 4 - Origin*:

HUC 4 - Destination*:

HUC 10 - Origin*:

HUC 10 - Destination*:

Calculate Reset

USGS Hydrology Unit Code 4 Watershed Boundaries

- 0501 - Allegheny
- 0502 - Monongahela
- 0503 - Upper Ohio
- 0504 - Muskingum
- 0505 - Kanawha
- 0506 - Scioto
- 0507 - Big Sandy-Guyandotte

Figure 8-1 “What If” Attenuation Calculator

“What-If” Attenuation Calculator

ORB Project sellers will be able to utilize the “What-If” Attenuation Calculator to run through any what-if scenarios between any two HUC10 locations, where attenuation ratios exist.

Potential sellers will be able to navigate to the “Attenuation Tool” tab of the RFI page (Figure 3-1), enter their quantity, price, seller’s and buyer’s HUC 4 and HUC 10 location, select Project Type and press on “Calculate” button.

Calculator will display attenuated buyer’s quantity and price, according to the following formula:

- $Quantity\ At\ Destination = (Point\ Of\ Generation\ Quantity * (1 - Attenuation\ Factor\ between\ Point\ of\ Generation\ location\ and\ Destination\ location))$
- $Price\ At\ Destination = (Point\ Of\ Generation\ Price / (1 - Attenuation\ Factor\ between\ Point\ of\ Generation\ location\ and\ Destination\ location))$

FACILITATING STEWARDSHIP TRANSACTIONS

RFI platform with the embedded attenuation tool (Trading Ratio tool) was developed with the view of incorporating compliance requirements of meeting regulatory limits by compliant entities. However, the trades being done during the ORB pilot program will be traded as “stewardship transactions” for the present time. In other words, all credits acquired by buyers will be purchased purely for public benefit and the credits will be retired rather than applied towards a permit obligation. Therefore the majority of stewardship transactions not need to account for the attenuation between buyer’s and seller’s locations.

Below process outlines in detail how to utilize the RFI platform to perform these types of stewardship transactions.

Type of ...	Additional Inf...	Listed Date	Project Type	Vintage	Seller Qu...	Measurement	Unit Class	Seller Price	Attenuation Factor	My Quanti...	My Price	My Cost
Offer (Sell)	Water Quantity	14 Aug 2013	Phosphorus Reduction	2013 - 20...	99	TN lbs/year	UNIT	99	0.00	99.00	99.00	9,801.00
Offer (Sell)		12 Aug 2013	Phosphorus Reduction	2014 - 20...	900	TN lbs/year	PIU	2	0.00	900.00	2.00	1,800.00
Offer (Sell)	Water Quantity	30 Jul 2013	Nitrogen Reduction	2017	892	TN lbs/year	PIU	90	0.00	892.00	90.00	80,280.00
Offer (Sell)	Water Quantity	25 Jul 2013	Phosphorus Reduction	2013 - 20...	800	TN lbs/year	UNIT	800	0.00	800.00	800.00	640,000.00
Offer (Sell)	Water Quantity	03 Sep 2013	Nitrogen Reduction	2016 - 20...	70	TN lbs/year	UNIT	7	0.00	70.00	7.00	490.00
Offer (Sell)	Water Quantity	04 Dec 2013	Phosphorus Reduction	2015	600	TN lbs/year	UNIT	777	0.00	600.00	777.00	466,200.00
Offer (Sell)	Water Quantity	28 Nov 2013	Nitrogen Reduction	2013 - 20...	60	TN lbs/year	UNIT	100	0.00	60.00	100.00	6,000.00
Offer (Sell)	Water Quantity	16 Aug 2013	Nitrogen Reduction	2013 - 20...	5,598	TN lbs/year	UNIT	569	0.00	5,598.00	569.00	3,185,260.00

Figure 0-1 RFI Platform for Stewardship credits buyer view

markit Welcome, Mer Test10

My Account Summary Manage My Units My Projects and Issuances **RFI** Bids/Offers User Admin Reports Activity Log Admin Registry

Offers (Sell) **Bids (Buy)** Attenuation Tool

Bids (Buy)

Ohio River Basin Water Quality Interstate Trading Program Search RFIs...

Location Information
 Enter HUC 10 Location Stewardship view Submit

Open Respond Unlist Transfer Enter Bid (Buy) Export to Excel Export to PDF

Type of ...	Additional Inf...	Listed Dat...	Project Type	Vintage	Buyer Q...	Measurement	Unit Class	Buyer Price	Attenuation Factor	My Quantity	My Price	My Total P...
Bid (Buy)	Additional Cer...	19 Jul 2013	Nitrogen Reduction	2011	100,000	TN lbs/year	UNIT	2.22	0.00	100,000.00	2.22	222,000.00
Bid (Buy)	Any	22 Jul 2013	Nitrogen Reduction	2013	10,000	TN lbs/year	PIU	10	0.00	10,000.00	10.00	100,000.00
Bid (Buy)	Any	24 Jul 2013	Any		23	Any	UNIT	23	0.00	23.00	23.00	529.00
Bid (Buy)	Water Quantity	26 Jul 2013	Nitrogen Reduction	2014	1,000	TN lbs/year	PIU	5	0.00	1,000.00	5.00	5,000.00
Bid (Buy)	Water Quantity	29 Jul 2013	Nitrogen Reduction	2012	4,500	TN lbs/year	UNIT	34	0.00	4,500.00	34.00	153,000.00
Bid (Buy)	Water Quantity	30 Jul 2013	Any	2019	6,700	TP lbs/year	PIU_RESERVE	34.89	0.00	6,700.00	34.89	233,763.00
Bid (Buy)	Any	30 Jul 2013	Nitrogen Reduction	2017	4,500	TN lbs/year	PIU	5.77	0.00	4,500.00	5.77	25,965.00

Figure 0-2 RFI Platform for Stewardship credits seller view

markit Welcome, Test User17

My Account Summary Manage My Units My Projects and Issuances **RFI** Bids/Offers User Admin Reports Activity Log Registry

Offers (Sell) Bids (Buy) Attenuation Tool

Offers (Sell)

Ohio River Basin Water Quality Interstate Trading Program Search RFIs...

Location Information
 Enter HUC 10 Location Stewardship view Submit

Open Respond Unlist Transfer Enter Offer (Sell) Export to Excel Export to PDF

RFI Notification Details - responding to an offer

From: (Unknown Account)

Date: 02 Jan 2014 16:54

Title: Response to offer #10000000013098

Enter Quantity that you wish to purchase: 500

Enter Price at which you wish to purchase: 5

My Cost: 2,500

Attenuation Factor: 0

Seller's Quantity: 500

Seller's Price: 5

Would like to purchase stewardship credits

Submit Cancel

Type of L...	Additional Info...	Listed Date	Project Type	Attenuation Factor	My Quantity	My Price	My Cost
Offer (Sell)	Fertilizer Use R...	17 Oct 2013	Nitrogen Red	00	143.00	30.00	4,290.00

Figure 0-3 Responding to an offer to obtain Stewardship credits

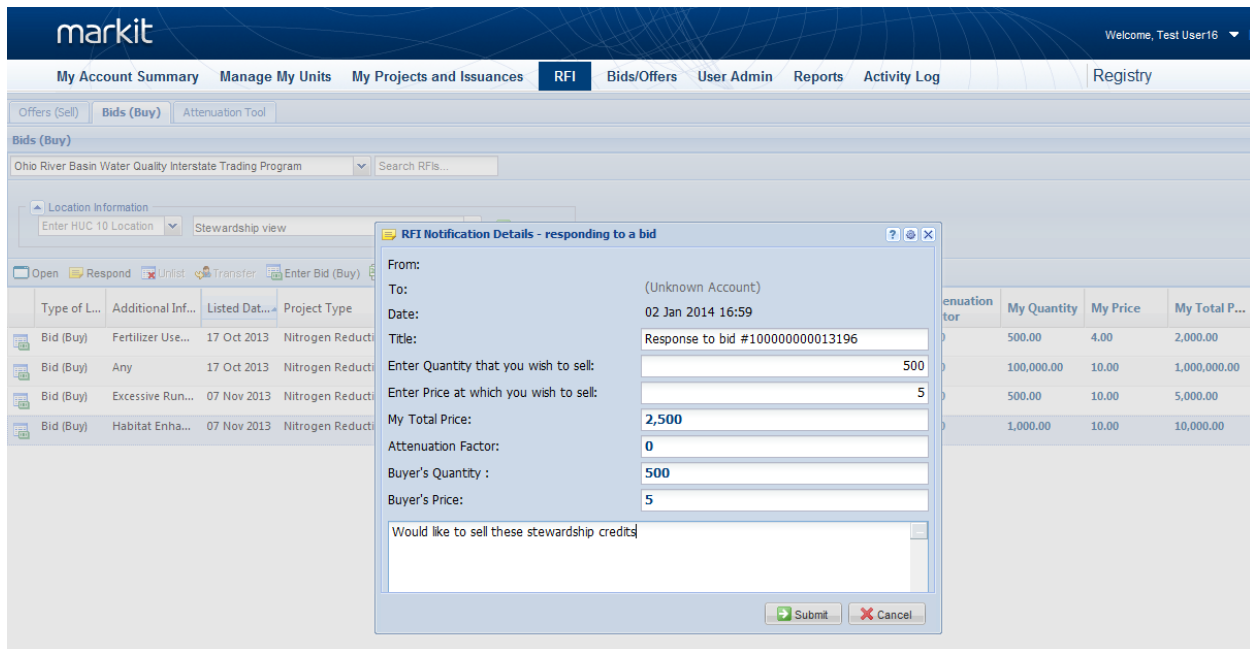


Figure 0-4 Responding to a bid to sell Stewardship credits

RFI Platform for Stewardship credits buyers view

ORB Project participants will be able to utilize the RFI platform to facilitate the review of Stewardship credits available for sale, i.e. credits without taking attenuation factors into consideration.

Stewardship credit buyer will be able to navigate to the RFI tool / Offers (Sell) tab, select “Stewardship view” as their HUC 10 location and press on “Submit” button. RFI tool will display all offers (credits for sale) that were posted for ORB Project standard (Figure 9-1). RFI grid will display Seller’s quantity in “My Quantity” column and Seller’s price in “My Price” column, since attenuation factor will default to 0.

Stewardship credit buyer will be able to respond to an offer by clicking on “Respond” button and entering quantity of Stewardship credits that he is interested in purchasing and price per lbs/year that he is willing to buy them at. “Respond” form (Figure 9-3) will populate “Attenuation Factor” field with 0 value to signify that this transaction is for purchase of Stewardship credits.

Clicking on the “Submit” button on the Response form will generate an email to the account holder associated with the RFI offer listing, which will enable the two parties to discuss the terms of a potential bilateral Stewardship transaction.

RFI Platform for Stewardship credits sellers view

ORB Project participants will be able to utilize RFI platform to facilitate the review of bids posted for the purchase of Stewardship credits, i.e. credits without taking attenuation factors into consideration.

Stewardship credit sellers will be able to navigate to the RFI tool / Bid (Buy) tab, select “Stewardship view” as their HUC 10 locations and press on “Submit” button. RFI tool will display all bids (interest in purchasing credits) that were posted for ORB Project standard (Figure 9-2). RFI grid will display Buyer’s quantity in “My Quantity” column and Buyer’s price in “My Price” column, since attenuation factor will default to 0.

Stewardship credit seller will be able to respond to a bid by clicking on “Respond” button and entering quantity of Stewardship credits that he is interested in selling and price per lbs/year that he is willing to sell them at. “Respond” form (Figure 9-4) will populate “Attenuation Factor” field with 0 value to signify that this transaction is for sale of the Stewardship credits.

Clicking on the “Submit” button on the Response form will generate an email to the account holder associated with the RFI bid listing, which will enable the two parties to discuss the terms of a potential bilateral Stewardship transaction.

9 TRANSFERS AND RETIREMENTS

The screenshot shows a software window titled "Transfer Details". It is divided into several sections:

- Transfer Details:** Includes a "Date:" field with the value "03 Apr 2013" and a "Comment:" text area.
- Transfer Units:** A table with columns: Account, Project, Transfer Amount, Price, Currency, and Measure. One unit is listed with a checked checkbox.
- Destination Account:** A section with a "To:" label and three tabs: "My Accounts", "Registry Accounts", and "Inter-Registry". Below the tabs is an empty "Account" list.

At the bottom right of the window are "Submit" and "Cancel" buttons.

Account	Project	Transfer Amount	Price	Currency	Measure
<input checked="" type="checkbox"/> TEST ACCOUNT ORB 001	TEST PROJECT ORB 002	10000	0	Choose One..	TN lbs/year

Ohio River Basin Water Quality Interstate Trading Program - Nitrogen Reduction
ORB-BAW-US-100000000003451-01012013-31122013-1-10000-MER-0-P

Figure 9-1 Transfer Form

Retire Units

Total Quantity: 10000

Units						
Account ▲	Project	Retirement Amount	Measure	Publicly Visible	Display Account Name?	Receive retirement certificate (\$200 fee)
<input checked="" type="checkbox"/> TEST ACCOUNT ORB 001	TEST PROJECT ORB 002	10000	TN lbs/year	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ohio River Basin Water Quality Interstate Trading Program - Nitrogen Reduction ORB-BAW-US-100000000003451-01012013-31122013-1-10000-MER-0-P						

Remarks:

Ok Cancel

Figure 9-2 Retirements Form

Transfer List Retire Convert Discard Export New Search by serial no.

Project	Account	Vintage	Country	Holdin...	Measurement	Public Visibili...	Status
TEST PROJECT ORB 002 Ohio River Basin Water Quality Interstate Trading Program - Nitrogen Reduction ORB-BAW-US-10000000003451-01012013-31122013-1-10000-MER-0-P	TEST ACCOUNT ORB 001	2013	United Stat...	10,000	TN lbs/year	No	Active
TEST PROJECT ORB 005 Ohio River Basin Water ORB-BAW-US-10000000003451-01012013-31122013-1-10000-MER-0-P	TEST ACCOUNT ORB 001	2013	United Stat...	100,000	TN lbs/year	No	Active
TEST PROJECT ORB 008 Ohio River Basin Water ORB-BAW-US-10000000003451-01012013-31122013-1-10000-MER-0-P	TEST ACCOUNT ORB 001	2013	United Stat...	100,000	TN lbs/year	No	Active

Transfer Details

Date: 03 Apr 2013

Comment:

Transfer Units

Account	Project	Transfer Amount	Price	Curren...	Meas...
<input checked="" type="checkbox"/> TEST ACCOUNT ORB 001	TEST PROJECT ORB 002	10000	0	Choose One..	TN lbs/year
Ohio River Basin Water Quality Interstate Trading Program - Nitrogen Reduction ORB-BAW-US-10000000003451-01012013-31122013-1-10000-MER-0-P					
<input checked="" type="checkbox"/> TEST ACCOUNT ORB 001	TEST PROJECT ORB 005	100000	0	Choose One..	TN lbs/year
Ohio River Basin Water Quality Interstate Trading Program - Nitrogen Reduction ORB-BAW-US-10000000003454-01012013-31122013-10001-110000-MER-0-P					
<input checked="" type="checkbox"/> TEST ACCOUNT ORB 001	TEST PROJECT ORB 008	15000	0	Choose One..	TN lbs/year
Ohio River Basin Water Quality Interstate Trading Program - Nitrogen Reduction ORB-BAW-US-10000000003465-01102012-30092013-122574-137573-MER-0-P					

Destination Account:

To:

My Accounts Registry Accounts Inter-Re

Account

Submit Cancel

Page 1 of 1

Figure 9-3 Batch Transfers

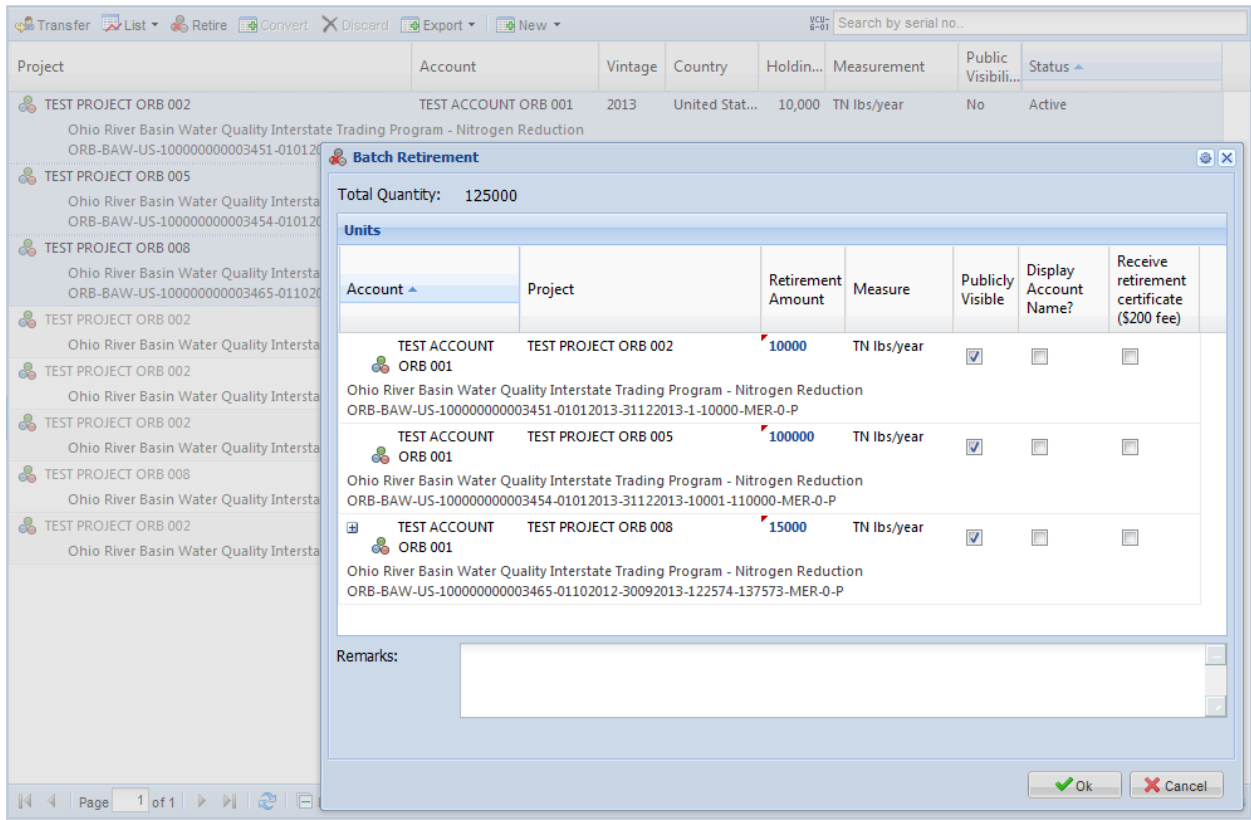


Figure 9-4 Batch Retirements

Figure 9-5 Transfer Form for attenuated credits

Credit transfers

All transactions of credits will take place within a “Manage My Units” page of the Registry. This portfolio-management page provides a filtering system allowing the user to select how they would like their credits to be displayed; for example, by project, by sub-account, and by project type. The screen displays all credits and their details available to a user. Double-clicking on any single unit block displays the unit blocks’ details and the actions that are available to the user. A unit “block” refers to a group of credits with sequential serial numbers. For example, ten credits listed in the Registry with block numbers 1-10 are reflected in the Registry as a single “block” of ten credits.

Any user permissioned for transfers (currently Markit) would select one block of units and push the “Transfer” button to initiate a transfer. A “Transfer Detail” window would then open that allows the user to enter the quantity of credits to be transferred and the price per credit (Figure 10-1). The user will have the option of conducting an internal transfer to one of the user’s own sub-accounts, or a transfer to another Registry account. The list of sub-accounts to which credits can be transferred is displayed for the user. Transfers to another Registry account would require that the user input the 15-digit numeric ID of his or her counterparty. This functionality works similar to an electronic bank transfer process. The system validates the ID of the counterparty and allows the transfer to proceed if the account ID is recognized. The user then presses “Submit” to commence the transfer. Once a transfer is requested, notifications are logged in the

“Notifications” tab and emailed to the transferring account’s users, the receiving account’s users and all Markit Administrators. The pending transfer appears within the “Manage My Units” page of both the transferring and receiving account. The receiving account can click on an incoming transfer to review the details and accept it.

Credit retirements

The Registry offers comprehensive retirement functionality for the appropriate users (Figure 10-2). Users select from a block of credits and specify the retirement details. Each user will be able to input the retirement quantity and retirement remarks. Notification is sent to both the Registry Administrator and the user retiring the credits.

Batch credit transfers and retirements

At the end of Q4 2012, we built out functionality for users to be able to select multiple credit blocks, identify prices and counterparties for each block and execute this block transaction in one step (Figure 10-3). We have also developed similar functionality for retirements (figure 10-4). Users are able to select multiple blocks of credits and can retire them in one step; applying visibility settings for each retired block.

Transferring Attenuated Credits

ORB Project participants will be able to utilize a customized transfer form to reflect results of their bilateral transactions on the Registry.

Once the OTC bilateral transaction is finalized, sellers will be able to navigate to the RFI page, select their offer (credits for sale listing) that was successfully negotiated with the buyer and click on the “Transfer” button. Transfer form will appear (Figure 10-5). Sellers will enter the agreed upon sale quantity and agreed upon sale price and enter buyer’s Registry account number.

Registry will automatically display HU4 and HUC 10 drop-down lists. Seller will be able to populate HUC 4 and HUC 10 locations with buyer’s locations, which will automatically compute Buyer’s Quantity and Buyer’s Price sections of the form according to the following formalis:

- *Buyer’s Attenuated Quantity = (Quantity offered by seller *(1-Attenuation Factor between Seller’s location and Buyer’s location))*
- *Buyer’s Attenuated Price = (Price specified by seller /(1-Attenuation Factor between Seller’s location and Buyer’s location))*

Seller will be able to click on the Submit button, which will initiate a transfer approval request to the Buyer. Once the Buyer approves the transfer, credits will become active in Buyer’s account and will be displayed appropriately with attenuated quantities in the Buyer’s view of the Registry.

10 COMPREHENSIVE REPORTING

Projects (2)											
Issuances											
Current Holdings											
Retirements											
Incoming Transfers											
Outgoing Transfers											
Start	01 Mar 2013	End		Submit	Export						
Account Name	Project Name	Project Status	Project Start Date	Activated On	Public Visibility	Latitude	Lo...	Watershed (HUC 4)	Watershed (HUC 10)		
TEST ACCOUNT ORB 001	TEST PROJECT ORB 005	Active	2013-03-22	22 Mar 2013	Yes	0	0	Allegheny	Allegheny River		
TEST ACCOUNT ORB 001	TEST PROJECT ORB 006	Active	2013-03-22	22 Mar 2013	Yes	0	0	Allegheny	Allegheny River		

Figure 10-1 Projects Report

Projects (2)													
Issuances (2)													
Current Holdings													
Retirements													
Incoming Transfers													
Outgoing Transfers													
Start	01 Mar 2013	End		Submit	Export								
Account Name	Project Name	Vintage	Issued Quantity	Serial Number	Measurement	Unit Type	Issuance requ...	Issuance D...	Verifier	Regulatory Au...	Public Visi...		
TEST ACCOUNT ORB 001	TEST PROJECT ORB...	2013	10,000	ORB-BAW-US-...	TN lbs/year	UNIT	21 Mar 2013	21 Mar 2013	Ohio Department of Natural Resources	Ohio EPA	No		
TEST ACCOUNT ORB 001	TEST PROJECT ORB...	2013	100,000	ORB-BAW-US-...	TN lbs/year	UNIT	22 Mar 2013	22 Mar 2013	Ohio Department of Natural Resources	Ohio EPA	No		

Figure 10-2 Issuances Report

Projects (2)									
Issuances (2)									
Current Holdings (2)									
Retirements									
Incoming Transfers									
Outgoing Transfers									
Start	01 Mar 2013	End		Submit	Export				
Account Name	Project Name	Vintage	Quantity	Serial Number	Measurement	Unit Type	Public Visibility	Status	
TEST ACCOUNT ORB 001	TEST PROJECT ORB 002	2013	10,000	ORB-BAW-US-10000...	TN lbs/year	UNIT	No	Active	
TEST ACCOUNT ORB 001	TEST PROJECT ORB 005	2013	100,000	ORB-BAW-US-10000...	TN lbs/year	UNIT	No	Active	

Figure 10-3 Current Holdings Report

Projects										
Issuances										
Current Holdings										
Retirements (38)										
All Transfers										
Start	01 Mar 2013	End		Submit	Export					
Account Name	Project Name	Vintage	Retired Qua...	Serial Number	Measurement	Retirement Date	Retirement Rema...	Public Visibility		
TEST ACCOUNT V2.0 202	001 TEST PROJECT V2.0 VISIBL...	2013	338,994	VCS-VER-US-100000000...	VER (TCO2e)	04 Mar 2013		Yes		
TEST ACCOUNT V2.0 202	001 TEST PROJECT V2.0 VISIBL...	2013	1	VCS-VER-US-100000000...	VER (TCO2e)	01 Mar 2013	pd 13 feb accout...	Yes		
TEST ACCOUNT V2.0 202	001 TEST PROJECT V2.0 VISIBL...	2013	1	VCS-VER-US-100000000...	VER (TCO2e)	01 Mar 2013	pd 13 feb accout...	Yes		

Figure 10-4 Retirements Report

Projects													
Issuances													
Current Holdings													
Retirements (38)													
All Transfers (37)													
Start	01 Mar 2013	End		Submit	Export								
Source Acco...	Source Accoun...	Destination A...	Destination Acc...	Project Name	Vintage	Quant...	Serial Number	Measurement	Transfer Initiated ...	Transfer Accepte...	Public Vis...	Price	Curr...
100000000001...	DEP VOSTRO	100000000018...	DF TEST Forwar...	TEST PROJECT For...	2015	1,000	PENNV-SCU-J-...	lbs/year	12 Mar 2013	12 Mar 2013	No	3.45	USD
100000000001...	DEP VOSTRO	100000000018...	DF TEST Forwar...	TEST PROJECT For...	2013	1,000	PENNV-SCU-A-...	lbs/year	12 Mar 2013	12 Mar 2013	No	2.56	USD
100000000001...	DEP VOSTRO	100000000018...	DF TEST Forwar...	TEST PROJECT For...	2014	1,000	PENNV-SCU-J-...	lbs/year	12 Mar 2013	12 Mar 2013	No	5.67	USD
100000000001...	DEP VOSTRO	100000000018...	DF TEST Forwar...	TEST PROJECT For...	2013	1,000	PENNV-SCU-J-...	lbs/year	12 Mar 2013	12 Mar 2013	No	4.55	USD

Figure 10-5 Transactional Price Report

My Account Summary Manage My Units My Projects and Issuances RFI Bids/Offers Reports User Admin Activity Log							
Activity Logs (17)							
Start	09 Apr 2013	End		Submit	Export		
Activity Type	Date	Account Name	Project Name	Standard	Quantity	Vintage	
Account Accepted by 3rd Party	09 Apr 2013 09:59:10 AM	TEST ACCOUNT ORB 0904...					
Account Activated	09 Apr 2013 10:00:55 AM	TEST ACCOUNT ORB 0904...					
	09 Apr 2013 10:11:38 AM	TEST ACCOUNT ORB 0904...	TEST PROJECT ORB 09042013 001				
	09 Apr 2013 10:12:05 AM	TEST ACCOUNT ORB 0904...	TEST PROJECT ORB 09042013 001				
Issuance Submitted	09 Apr 2013 10:12:08 AM	TEST ACCOUNT ORB 0904...	TEST PROJECT ORB 09042013 001	Ohio River Basin Water Q...	20,000.000 TN lb...	2012 - 2013	
	09 Apr 2013 10:13:37 AM	TEST ACCOUNT ORB 0904...	TEST PROJECT ORB 09042013 001	Ohio River Basin Water Q...	20,000.000 TN lb...	2012 - 2013	
Issuance Activated	09 Apr 2013 10:13:53 AM	TEST ACCOUNT ORB 0904...	TEST PROJECT ORB 09042013 001	Ohio River Basin Water Q...	20,000.000 TN lb...	2012 - 2013	
Transfer Initiated	09 Apr 2013 10:17:25 AM	ORB Nikodem's Test 1	Nikodem's QA ORB Test	Ohio River Basin Water Q...	356.000 TP lbs/y...	2012	
Serial No: ORB-BAW-US-100000000022115-01012012-31122012-90001-90356-MER-0-P							
Transfer Initiated	09 Apr 2013 10:17:25 AM	TEST ACCOUNT ORB 0404...	TEST PROJECT ORB 040413002	Ohio River Basin Water Q...	100.000 TN lbs/y...	2012 - 2013	
Serial No: ORB-BAW-US-100000000021913-01102012-30092013-8001-8100-MER-0-P							
Transfer Initiated	09 Apr 2013 10:17:25 AM	TEST ACCOUNT ORB 0904...	TEST PROJECT ORB 09042013 001	Ohio River Basin Water Q...	333.000 TN lbs/y...	2012 - 2013	
Serial No: ORB-BAW-US-100000000022413-01102012-30092013-213121-213453-MER-0-P							
Transfer Accepted	09 Apr 2013 10:18:35 AM	TEST ACCOUNT V2.1 001 LL	Nikodem's QA ORB Test	Ohio River Basin Water Q...	356.000 TP lbs/y...	2012	
Serial No: ORB-BAW-US-100000000022115-01012012-31122012-90001-90356-MER-0-P							
Transfer Accepted	09 Apr 2013 10:18:35 AM	TEST ACCOUNT V2.1 001 LL	TEST PROJECT ORB 040413002	Ohio River Basin Water Q...	100.000 TN lbs/y...	2012 - 2013	
Serial No: ORB-BAW-US-100000000021913-01102012-30092013-8001-8100-MER-0-P							
Transfer Accepted	09 Apr 2013 10:18:35 AM	TEST ACCOUNT V2.1 001 LL	TEST PROJECT ORB 09042013 001	Ohio River Basin Water Q...	333.000 TN lbs/y...	2012 - 2013	
Serial No: ORB-BAW-US-100000000022413-01102012-30092013-213121-213453-MER-0-P							
Retired	09 Apr 2013 10:19:21 AM	ORB Nikodem's Test 1	Nikodem's QA ORB Test	Ohio River Basin Water Q...	122.000 TP lbs/y...	2012	
Serial No: ORB-BAW-US-100000000022115-01012012-31122012-90357-90478-MER-0-P							
Retired	09 Apr 2013 10:19:21 AM	TEST ACCOUNT ORB 0404...	TEST PROJECT ORB 040413002	Ohio River Basin Water Q...	69.000 TN lbs/y...	2012 - 2013	
Serial No: ORB-BAW-US-100000000021913-01102012-30092013-8101-8169-MER-0-P							

Figure 10-6 Activity Log

Basic Reporting functionality

At the end of Q4 2012, Registry has built out comprehensive reporting functionality in the Registry. Reports enable users to track their activities on the Registry and evaluate the status of their projects and holdings. Additionally, reports allow for an account to be audited more easily. Users are able to export projects, issuances, current holdings, retirements, transfers, and activities to downloadable reports. The user has the ability to export to both .XLS and .PDF file formats. Users have a page designed specifically to enable to running of reports within a time period defined by the user.

Configured for ORB Project: Projects Reporting

Users are able to view the following columns in the projects report (Figure 11-1):

- Account Name
- Project Name
- Project Status
- Project Start Date
- Activated On
- Public Visibility
- Latitude
- Longitude
- Watershed (HUC 4)
- Sub-Watershed (HUC 10)
- BMP
- Nutrient Type

-
- Calculation Methodology

Configured for ORB Project: Issuances Reporting

Users are able to view the following columns in the issuances report (Figure 11-2):

- Account Name
- Project Name
- Vintage
- Issued Quantity
- Serial Number
- Measurement
- Unit Type
- Issuance Requested Date
- Issuance date
- Public Visibility
- Verifier
- Regulatory Authority

Current Holdings Reporting

Users are able to view the following columns in the current holdings report (Figure 11-3):

- Account Name
- Project Name
- Vintage
- Quantity
- Serial Number
- Measurement
- Retirement Date
- Retirement Remarks
- Public Visibility

Retirements Reporting

Users are able to view the following columns in the retirements report (Figure 11-4):

- Account Name
- Project Name
- Vintage
- Retired Quantity
- Serial Number
- Measurement
- Retirement Date
- Retirement Remarks
- Public Visibility

Configured for ORB Project: Transactional Price Report

Users are able to view all of their over the counter transactional activities with associated pricing in this report (Figure 11-5):

- Source Account Name
- Destination Account Name
- Project Name
- Vintage
- Quantity
- Price
- Serial Number
- Measurement
- Transfer Initiated Date
- Transfer Accepted Date

Activity Log

Users also have access to an activity log allowing them to view all events that took place within their account within a time period defined by the user (Figure 6-6).

11 GLOSSARY

Term	Definition
EPRI	Electric Power Research Institute
HUC	Hydrological Unit Codes
IDEM	Indiana Department Of Environmental Management
KYC	Know-Your-Client
ORB	Ohio River Basin Water Quality Interstate Trading Pilot
OTC	over-the-counter
PIU	Pending Issuance Unit
Registry	The Markit Registry
Regulatory Authority	EPA agency that will be providing regulatory certification report
RFI	Markit's Request for Information Platform
SWCD	The Soil and Water Conservation Districts
Verifier	State Agency, verifying the project
WARMF	Watershed Analysis Risk Management Framework