

# REQUEST FOR PROPOSALS: SOIL HEALTH PORTAL

December 4, 2024

## Introduction

The Soil Health Institute (SHI) is a global non-profit committed to safeguarding and enhancing the vitality and productivity of soil through scientific research and advancement. The Institute requests proposals for developing a **Portal** where customers may enter soil sample meta and management data, create soil sample identification labels, and view and export their soil health test reports (interpreted results) that have been reviewed and released by SHI scientists following standardized laboratory testing.

SHI has existing python and R workflows that enable current internal soil health reporting and analyses. A user interface is required that allows customers to enter the workflow where pre-existing algorithms will be accessed for data analyses and report generation.

## OBJECTIVES

- Develop a portal for managing, collecting, and sharing soil health data that can be used by SHI scientists and commercial laboratory customers.

## Development Process

### PHASE 1: BETA RELEASE

Front-end development of an interface able to satisfy the following elements:

- User login (customers, labs, SHI scientists)
- Basic data sharing permissions (labs and SHI)
- Entering soil management information
- Geolocation selection
- Generating soil sample IDs and labels
- Samples shipped from the user to the lab
- Data movement from lab to the database
- Data movement from the database to the user

SHI will provide a database model (sample metadata, management data, soils data) to guide design and development of the portal and will rely on the developer for expertise in user management, including linking users to soils data. SHI will also work with the successful vendor to fully articulate SHI's vision for the customer journey.

**Timeline:** 3 to 6 months from signing contract.

### PHASE 2: FULL RELEASE

Improving and building out the Portal with advanced features:

- UX/beta testing of the Portal with different user groups (e.g., growers, labs):

- gathering and integrating feedback
- fixing bugs
- Advanced user logins (crop consultants, companies/aggregators)
- Advanced data sharing permissions (e.g., releasing data to companies/aggregators)
- Ability to upload .csv files with management data to a field profile rather than entering management data manually
- Multiple sample label generation
- Portal connectivity with FedEx/UPS track API
- Limited functionality mobile app with the ability to:
  - create samples and labels for sites with pre-populated management information (completed on desktop app)
  - add location data for sample labels

**Timeline:** 6 months from Beta release.

### PHASE 3: MAINTENANCE

- Troubleshooting
- Pushing regional Benchmarking data model updates to the Portal

**Timeline:** Ongoing.

### PHASE 4: DREAMS

- Integrations with Slakes app to compare user samples to regionally relevant results

**Timeline:** TBD.

## Functional Requirements

### USER MANAGEMENT

- User registration and MFA (option to opt-in).
- Role-based access control and permissions (Customers, crop consultants [e.g., CCA], companies/aggregators, SHI Scientists, Labs, Admins).
- Direct back-end access to portal and database for SHI.

### SECURITY

- Data center at-rest encryption using Advanced Encryption Standard (AES) 256-bit or better.
- In-transit communication between clients, servers, and data centres using Secure Sockets Layer (SSL) or Transport Layer Security (TLS) protocols.

### DATA PRIVACY

- All soil health test data and associated metadata is owned by the portal users (i.e., soil health test customers).
- SHI receives unrestricted license to use anonymized data (i.e., PII removed) for varying purposes (e.g., generating benchmarks, research, sustainability assessments).

- Customers can add an affiliation with a company/aggregator to allow data sharing with said company/aggregator for sustainability reporting purposes. In this case, PII is retained in order for the company/aggregator to identify the grower in their supply shed.

## SAMPLE METADATA AND MANAGEMENT DATA

- Integration with cloud GIS system to drop a pin and identify GPS coordinates for a sample ID. (Future ability to load a .shp file and/or draw field boundaries).
- Sample ID association with sampling location that may be sampled repeatedly over time (e.g., resampling same location every 3 years).
- Ability to manage sample metadata and management data associated with samples.
- Associated sample metadata includes: sample name, location, sampling date.
- Associated management data is based on management units. Each sample must be associated with one validated management unit.
- Each field profile is composed of one to several crop profiles. A field profile cannot be validated if it does not have any associated crop profiles.
- Each crop profile is composed of one to several management activities: planting/harvest, tillage, cover crops, organic amendments (can only have one planting/harvest practice per crop, but can have multiple instances of the others). Crop profiles cannot be validated if it does not have planting/harvest information. Management information will include date of activity and details for the activity.
- Management information is used by SHI to automatically calculate continuous management indices (code supplied by SHI). Management indices are included in the data reporting/viewing/visualization phase.
- (Phase 2 release includes ability to upload .csv files with management data that populates a field profile without needing to enter this manually. There should be guidance on the necessary fields that need to have information, and a validation step to ensure that the uploaded .csv file is being appropriately ingested into the database.)

## SAMPLE LABEL CREATION

- **Sample ID validation.** Before users can print sample labels, management information associated with the sample must be completed and validated. Once associated metadata management information is validated, the system automatically assigns a sample ID and generates a QR code.
- **Sample label generation.** Users will print off auto-generated sample labels (or batch print labels for several samples) in PDF format on a sheet (or sheets) of paper to attach to their sample before shipping to the lab. Two labels per sample will be created, one for a composite soil health sample and another for intact aggregates. Creation of a half-page template for sample labels, and ability to edit the template content.

## SAMPLE SUBMISSION

- Step-by-step instructions for sample collection, preparation, and shipping.
- Data progress tracking.
- Portal connectivity with FedEx/UPS track API so that tracking numbers for soil samples to know shipping status of samples.

## LAB INTEGRATION

- Labs can scan the QR code on the sample label; communicates to the portal database that samples have been received by the lab.
- Able to use existing APIs for transfer of soils data to SHI scientists for review.
- SHI scientists able to submit requests to the lab for sample reruns (including push notifications via email to the lab).
- Push notifications (e.g., via email) to the end user once sample results are uploaded by the lab

## TEST RESULTS MANAGEMENT

- Automatic population of reports in customer accounts once uploaded by SHI scientists.
- Notification system for test results availability.

## BENCHMARK MODELING

- Ability for SHI scientists to program models into the database and for these models to be periodically update and refresh as new data is added to the database.
- Dedicated tab in the portal for users to search/query a map with highlighted regions for where Benchmarks have been established.
- Users can select/define an “area of interest”/”point of interest” and display benchmark data for that selection.

## PORTAL DASHBOARD

- Dashboard home page displays new messages/notifications for users (e.g., reminders to enter management information, new sample status, test results, updates to the portal), their linked Lab Partner, explore Benchmarks
- Portal tabs: Home, Management Info, Samples, Results, Benchmarks, Resources.

## PORTAL DASHBOARD FOR AGGREGATORS (PHASE 2: FULL RELEASE)

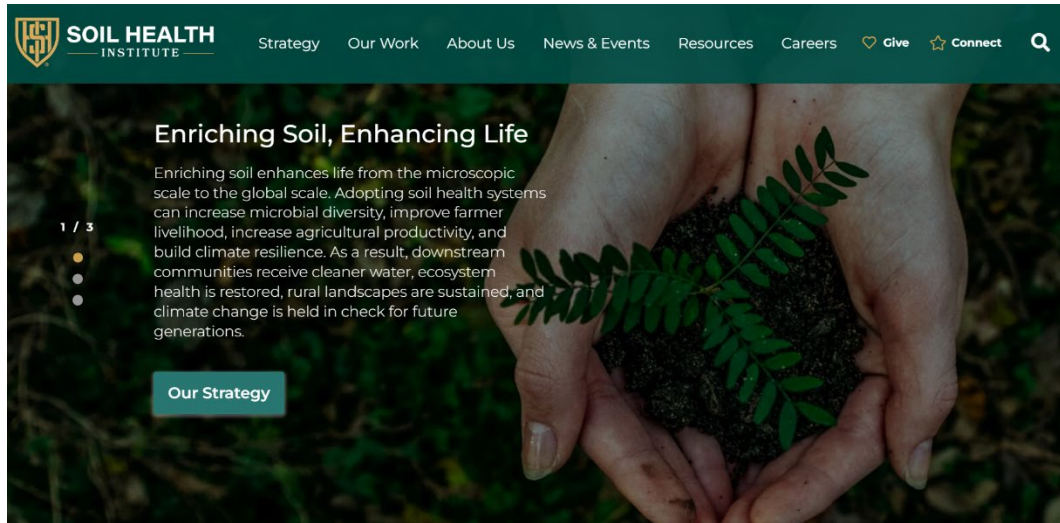
- Aggregators can access and download test results and management data that have been linked to their company for supply shed sustainability evaluation.
- It is assumed that aggregators will do their own data visualization and presentation, and the portal is only necessary for being able to receive that data.

## RESOURCES

- Portal includes SHI resources on interpretation of test results, as well as contact information for farmer mentors and technical specialists.
- Resources are tailored based on crops management by the user and their location.

## User Interface

- Consistent with SHI branding and design (see [soilhealthinstitute.org](https://soilhealthinstitute.org)):



## Hosting

- Hosted at [portal.soilhealthinstitute.org](https://portal.soilhealthinstitute.org)
- Back-end infrastructure: Microsoft Azure or AWS.

## Code Base

- Preference for developers that work with Python.

## Devices

- Web application for desktop (PHASE 1: BETA RELEASE)
- Limited functionality mobile app (PHASE 2: FULL RELEASE)

## Timeline

From signing contract:

- Beta release – 3 months from signing contract
- Full release – 9 months from Beta release
- Maintenance – ongoing

## Budget

SHI requests that quotes be broken down into the three phases of development:

PHASE 1: Beta build

PHASE 2: Full build

PHASE 3: Maintenance costs

## **Submission, Q&A Period, and Review**

Proposals are to be submitted to **Cameron Ogilvie, Soil Health Educator**, at the following address: [cogilvie@soilhealthinstitute.org](mailto:cogilvie@soilhealthinstitute.org). Please include "Portal Proposal" in the subject. The deadline to submit the proposal is **February 14, 2025, 5 pm CST**.

Prior to proposal submission, interested parties can submit written questions to Mr. Ogilvie. Questions received prior to the close of the Q&A period on **January 24, 2025**, will be answered in writing and posted on the RFP webpage on **January 31, 2025**. Answers to all submitted questions will only be provided via the posted Q&A document.

Written proposals will be evaluated by SHI's selection committee based on the following criteria (listed in descending order of importance): budget, ability to complete the project in the required timeline and following SHI's specifications, and positive evaluation of vendors from prior clients. Preference will be given to vendors that can deliver all required components listed in the Request for Proposals.

The Soil Health Institute retains the right to accept any or none of the proposals submitted.