LIMS Implementation: Ensuring Success Through Pre-Purchase Diligence and a Post-Go-Live Responsibility Matrix

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NATIONAL ENVIRONMENTAL MONITORING CONFERENCE
CHICAGO, ILLINOIS
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ENVIRONMENTAL SERVICES
CITY OF PORTLAND

WPCL PROFILE

- 2 ICP/MS, ICP
- 3 GC/MS, 2 GC
- SFA, FIA, DA, IC
- TOC, CN, O & G, BOD, pH, ETC, ETC
- 15 STAFF:
  - Manager
  - QA, Production, & Technical Coordinators
  - 5 Specialists (Metals, Organics, Micro)
  - 6 Analysts

WHY A NEW LIMS AFTER TEN YEARS?

- COULDN'T ELECTRONICALLY TRANSFER INSTRUMENT DATA INTO LIMS
- COULDN'T ELECTRONICALLY PRODUCE QC REPORTS
- NEW INSTRUMENTATION AND NEW METHODS
- INCREASE IN WORK LOAD

HINDSIGHT IS 20:20!

EFFORT TO SAVE EXISTING LIMS

- CONSUMED 3 ½ YEARS
- COST IN EXCESS OF $85K
- THIRD-PARTY APP (LATER SCRAPPED)
- INCALCULABLE HEARTBURN, FRUSTRATION, HOPELESSNESS, DESPAIR, ANGER, EVIL THOUGHTS

TURNING LEMONS INTO LEMONADE

- CREATED LAN FOR INTRUMENTS
  - SERVERS & PROTOCOLS FOR WORKING THROUGH THE CITY FIREWALL
  - SPECIALISTS CAN RUN INSTRUMENTS & POST-ANALYSIS TASKS FROM DESKS OUTSIDE LAB

- HIRED AN EXPERIENCED, FULL-TIME IT EXPERT/PROJECT MANAGER (SUCCESS FACTOR #1!)

- DETAILED EXISTING WORKFLOWS & IDENTIFIED BARRIERS TO ACHIEVING GOALS (SUCCESS FACTOR #2!)

- DECISION TO SCRAP EXISTING LIMS IN MAY 2009

RFP ISSUED NOVEMBER 2009

- 32 PAGES OF PROPOSAL INSTRUCTIONS AND RESPONSE FORMS (SUCCESS FACTOR #3!)
- 6 PROPOSALS

SUCCESS FACTOR #3

EXAMPLES OF REQUIRED TEXT RESPONSES

TECHNICAL PROPOSAL

FORM 5: APPLICATION DEVELOPMENT AND DESIGN

Development

Please limit your response to questions 1 - 5 on this form to three (3) pages.

1. Describe the LIMS application architecture.
2. Describe your software development and testing processes. Define any standard software methodologies utilized.
3. Discuss the technologies used to develop the proposed software. What language is the LIMS developed in and using what tools?
4. What programming tools are provided to your customers with the application for allowing modification of application functionality? How can a LIMS modified with these tools be ensured to be compatible with future vendor software upgrades?
5. How is your software especially suited to environmental analysis, i.e., testing of water, wastewater, and soil samples for compliance with environmental regulations?

Database

Please limit your response to questions 6 - 7 on this form to one (1) page.

6. Describe the documentation provided related to the LIMS data model (such as entity relationship diagrams, data flow diagrams, and data dictionary).
7. Which data fields are provided for test/analyte results entry for a sample?

Other

Please limit your response to questions 8 - 13 on this form to three (3) pages.

8. Describe the administrative tools used to configure the application without programming or direct database intervention. Describe how business rules, workflow, master data, and data validation can be configured within the system.
9. What tools are available within the LIMS to create queries with minimal effort and knowledge of the database structure?
10. Describe the reporting tools available within the LIMS.
11. Describe the capabilities of the LIMS to interface with other systems.
12. Describe your software's security approach.
13. How does your system support barcode technology?

FUNCTIONAL PROPOSAL

FORM 8: APPLICATION FUNCTIONALITY

Sample Login

Please limit your response to questions 1 - 4 on this form to two (2) pages.

1. Discuss login of routinely collected vs. non-routinely collected samples. Can default information about samples and analyses requested be stored for assignment at login?
2. For sample login, which data fields are provided to describe the sample, project, customer, collection, receipt, assigned tests and the login event?
3. Briefly describe how samples can be grouped together or associated with each other for common processing and information retrieval.
4. How can different lists of individual metals be stored for different customers or projects?
5. How can a sample be identified for rush analysis?
6. Which data regarding the collection of composite samples can be recorded?

QA/QC and Data Entry Validation

Please limit your response to questions 5 - 10 on this form to two (2) pages.

7. Briefly describe how the LIMS manages QA/QC samples for analytical batches.
8. How are calculations specified and assigned?
9. How can QA/QC samples for an analytical batch be associated with
   - the entire batch (such as blanks)
   - a subset of samples (such as matrix spikes)
   - a single other sample (such as duplicates)
   - itself (surrogate spikes)
10. At which step(s) in the workflow can a group of unknown samples and QA/QC samples be defined as an analytical batch?
    - at analysis setup (assuming unknown samples are logged in)
    - at results entry (manual or automated)
11. How are calibration standards managed?
12. Describe the scope and nature of data entry validation in the LIMS.

Querying, Reporting and Data Exports

Please limit your response to questions 11 - 13 on this form to two (2) pages.

13. What tools are available to search for a specific sample or set of samples?
14. Using the query tool(s) integrated in the LIMS, which data fields available? Are user-defined fields selectable?
15. Describe how data can be exported to external files or applications, including data obtained by using integrated query and reporting tools.

SUCCESS FACTOR #3

EXAMPLES OF REQUIRED TABLES

FORM 7: TECHNICAL ELEMENTS

For each statement below, please respond with a:

T if statement is true
F if statement is false

Where helpful, please provide additional information in the Comment field.

	Statement	T or F	Comment
Development			
1T	Software development and testing processes for the proposed LIMS are rigorous and documented		
2T	Vendor holds ISO 9001:2000 or ISO 9001:2008 certification for their quality management system		
3T	Vendor has policies and procedures for notifying clients of discoveries of critical software problems and availability of fixes		
Database			
4T	LIMS operates with a SQL Server 2005 or 2008 database		
5T	Vendor provides complete documentation of the database describing content of all tables and fields		
6T	LIMS provides ability to create user-defined fields		
7T	LIMS provides (or provides ability to create) these data fields for results at the analyte level: units, detection limit, reporting limit, qualifier, flag		
8T	LIMS provides (or provides ability to create) these data fields for results at the test and/or analyte level: source file reference, comments		
System Architecture			
9T	Application server can run on the Windows 2008 Server (64 or 32 bit) or Windows 2003 Server (64 or 32 bit) operating system (Indicate which or both in Comment)		
10T	Application server will run on VMWare 3.5x or 4.x (Vsphere) platform.		
11T	LIMS software updates to files on client PCs (if any) can be delivered automatically		
Enterprise Security			
12T	LIMS software functions with operating system updates and patches		
13T	LIMS system can integrate with an enterprise security directory (MS Active Directory) for user authentication		
14T	LIMS can use SQL Server user authentication		
LIMS Security			
15T	LIMS includes a configurable security function capable of limiting access to the LIMS and access to functions within the LIMS		

FORM 9: CORE FUNCTIONAL ELEMENTS

For each statement below, please respond with a:

T if statement is true
F if statement is false

Where helpful, please provide additional information in the Comment field.

	Statement	T or F	Comment
General			
1F	Supports compliance with NELAC		
Defining analytical tests and analytes			
2F	Tests for single and multiple analytes can be defined		
3F	A group of tests that includes more than one single and/or multiple analyte tests can be defined		
4F	Can store a default detection limit and reporting limit for each analyte		
5F	Can associate multiple names for the same chemical analyte		
6F	Can specify different reporting limits for different customers or projects		
7F	Can specify multiple sets of limits for each analyte, with different actions for each limit (such as notify, reject)		
Workflow			
8F	Can track a sample from receipt through final disposition by querying for its status		
Sample Login			
9F	Automatically generates a unique identifier for each sample		
10F	Can automatically generate an intelligent unique identifier for each sample per user defined rules		
11F	Every change to sample login data can be recorded in the audit trail		
12F	Can assign a priority for analysis		
13F	Allows users to manually login a single sample		
14F	Allows users to manually edit login data for a single sample, including adding and deleting test assignments		
15F	Allows users to manually login a group of samples, based from a single screen.		
16F	Allows users to manually edit login data for a group samples, including adding and deleting test assignments		
17F	LIMS provides ability to automatically assign default data, so only unique data is entered during sample login		
18F	LIMS provides ability to provide pick lists of items for selection		

GETTING TO A SHORT LIST

- 4 VENDORS SHORT-LISTED (DEC. 2009)

- DECIDED TO "SCRIPT" OUR REQUESTS FOR CLARIFICATION (SUCCESS FACTOR #4!)

    - SUBMIT ANSWERS IN WRITING
    - AGREE TO A 2 ½ HOUR LIVE, INTERACTIVE WEB PRESENTATION
    - BE PREPARED TO DISCUSS YOUR ANSWERS
    - BE PREPARED TO DEMONSTRATE SPECIFIC FEATURES
        - GENERIC SET FOR ALL VENDORS
        - VENDOR-SPECIFIC DEMOS

SUCCESS FACTOR #4

ALL VENDORS

METALS DEMONSTRATION

This laboratory has 3 major types of analysis for metals, using different preparation methods for each. They are:

- ICPMS analysis for water samples, reported in ug/L
- ICP/AES analysis for water samples, reported in mg/L and
- ICPMS analysis for soil samples, reported in mg/Kg.

1) Please explain and demonstrate how metals analytes can be coded so that:

a) the chemist can determine which type of analysis is required for a sample – ICPMS or ICP/AES – and exactly which elements are requested;

b) the chemist can determine that both dissolved and total metals are requested for a sample, and the element lists for dissolved and total are not the same;

c) only the requested analytes are reported to the customer, with the correct units and reference methods listed on the report;

2) Can results for additional elements be saved in the LIMS in non-reporting status? If so, can the status be changed to report the results at a later time? Please demonstrate.

3) Are units changeable for a given analysis? If so, are changes to the results updated automatically by changing the units? That is, if 45.7 ug/L is to be reported as 0.0457 mg/L, can that be done without changing the analysis code, and how is the change made. Please demonstrate.

Any additional information on how your LIMS can be used to handle the variable methods and element lists for metals is welcome.

QC REPORT DEMONSTRATION

Please demonstrate how your LIMS handles QC data and how QC reports are generated. Specifically we would like to see:

a) how QC results are associated with the correct samples in the LIMS;

b) how QC problems are flagged in the LIMS, and how chemists or validators may add QC comments;

c) how the QC report may be integrated with the analytical report for the customer;

d) how a narrative can be prepared and incorporated into the report;

e) an example of a formatted QC report that includes single-analyte and multi-analyte tests, and has several QC flags.

Any additional information on how your LIMS is used to report analytical QC data is welcome.

Vendor specific questions:

VENDOR-SPECIFIC

Technical Elements

Form 5, Question 2 and Form 7, Element 1T: Please provide a description of your software development and testing processes. The answer provided is not relevant to the question.

Form 7, Element 3T (as well as Form 16, Question 9): How are your clients notified of discoveries or critical software problems (before fixes are available)?

Form 7,Element 11T: How can updates to the standalone application be delivered automatically?

Implementation

Form 11, Question 5: The answer provided is not relevant to the question.

Functional Elements

(Metals and QA/QC questions)

Maintenance and Support

Form 16, Question 1: It is stated: “Inquiries taking more than 20 minutes to resolve ... will be charged at hourly rate for technical support.” This is not mentioned in attached Sample Maintenance Agreement. Please explain.

Form 16, Question 8: Please discuss the current efforts to redesign the application, database, and improve testing and development processes. Are there plans to provide a web-based application?

- **AND THEN THERE WERE 2…**
- **16 PAGES OF DETAILS FOR TWO-DAY, HIGHLY SCRIPTED DEMONSTRATION (SUCCESS FACTOR #5!)**

SUCCESS FACTOR #5

SCRIPTED DEMONSTRATIONS (OVERVIEW OF DAY #1 & DAY #2)

Day 1 Demonstration Schedule

Area	Demo #	Demonstration Topic	Duration	Start	End
Overview			**1 hr 45 mins**	**8:30**	**10:15**
	1	Vendor Background, LIMS History, and LIMS Customer Base		*Includes time for questions and a 15 minute break*	
	2 *	LIMS Overview and Basic Navigation			
		BREAK			
	3	Architecture of LIMS and Supporting Systems			
	4	LIMS Development and Configuration			
Configuration 1			**1 hr 45 mins**	**10:15**	**12:00**
	5	Users and Privileges		*Includes time for questions*	
	6	Tests and Analytes			
	7	Customers, Projects, and Sample Locations			
		LUNCH	**1 hr**	**12:00**	**1:00**
Configuration 2			**1 hr 30 mins**	**1:00**	**2:30**
	8	Workflow		*Includes time for questions and a 15 minute break*	
	9	QA/QC			
		BREAK			
Querying and Reporting Tools			**1 hr 30 mins**	**2:30**	**4:00**
	10	Querying Tool		*Includes time for questions*	
	11	Reporting Tool			

*** This demonstration will be presented on Day 1 and again on Day 2. All Laboratory staff will be invited to attend one of these sessions.**

Day 2 Demonstration Schedule

Area	Demo #	Demonstration Topic	Duration	Start	End
Overview	(2) *	LIMS Overview and Basic Navigation (Repeat)	**25 mins**	**8:00**	**8:25**
Workflow			**1 hr 45 mins**	**8:30**	**10:15**
	12	Sample Receiving		*Includes time for questions and a 15 minute break*	
	13	Work Planning and Production			
	14	Results Entry			
		BREAK			
Special Topics 1			**1 hr 45 mins**	**10:15**	**12:00**
	15	Data Modifications, Additions, Deletions		*Includes time for questions*	
	16	Audit Trail			
	17	Metals Tests and Analytes			
		LUNCH	**60**	**12:00**	**1:00**
Special Topics 2			**1 hr 30 mins**	**1:00**	**2:30**
	18	Instrument Interfacing		*Includes time for questions and a 15 minute break*	
	19	NELAC Compliance			
		BREAK			
Summary			**1 hr 30 mins**	**2:30**	**4:00**
	20	Implementation			
	21	Differentiation			
		Final Questions and Answers			

*** This demonstration will be presented on Day 1 and again on Day 2. All Laboratory staff will be invited to attend one of these sessions.**

SUCCESS FACTOR #5

SCRIPTED DEMONSTRATIONS (EXAMPLE DAY #1 DETAILS)

Day 1 (continued)
Demonstration Area: Overview

Demonstration 3:
Architecture of LIMS and Supporting Systems

Expected Results:

BES staff will become familiar with the proposed architecture of the LIMS and supporting systems.

Guidelines for presentation:

Provide a high-level overview of the LIMS architecture and supporting systems, including:

- major LIMS modules/components and their relationships;
- optional LIMS modules (if any)
- options for installation of the application
  For each option available, please
  - indicate the type of client technology (such as rich client, thin client)
  - indicate required servers
  - show the application files, if any, that would reside on each client PC
  - demonstrate or discuss how application files, if any, can be distributed to client PCs
  - indicate any other software requirements for client PCs (such as .NET Framework)

Show the deployment instructions, accompanying the most recent upgrade for your product.

Briefly present the capabilities of the LIMS API to import data into the LIMS in a controlled and audited manner. Describe how the API has been used by your customers. Demonstrate a simple application of the API including a code sample.

Demonstration 4:
LIMS Development and Configuration

Expected Results:

BES staff will become familiar with
- the vendor's process for LIMS software development, testing, documentation and distribution
- the administrative tools available with the LIMS to configure the such items as workflow, screen appearance and content, and presentation of screens to various types of users.

Guidelines for presentation:

- Discuss development, testing, and documentation of software before release.
- Discuss notification and distribution of major releases, minor revisions, and updates.
- Briefly demonstrate the LIMS' administrative tools available to configure such items as workflow, screen appearance and content, and presentation of screens to various functional groups of users.

Day 1 (continued)
Demonstration Area: Configuration 2

Demonstration 9
QA/QC

Expected results:

BES staff will become familiar with quality assurance and quality control functionality available in the LIMS including:
- managing QA/QC samples for analytical batches
- data review and validation.

Guidelines for presentation:

Demonstrate:

- how QA/QC calculations are defined in the LIMS;
- how a preparation batch can be defined
- how a group of unknown samples and QA/QC samples can be defined as an analytical batch, and at which step(s) in the workflow this can be done;
- how QA/QC samples for an analytical batch be associated with:
  - the entire batch (such as blanks);
  - a subset of samples (such as matrix spikes);
  - a single other sample (such as duplicates);
- how surrogate results are associated with a sample/analysis
- the LIMS functionality for data review and validation, including statistical quality control

Create an analytical batch for TSS analysis
- Assign multiple sets of duplicates within the batch
- One check standard is run per day for TSS and BOD tests. Can this standard be associated with multiple daily batches?

Create a QC batch for metals analysis
- Include samples with different sets of individual metals requested
- Assign multiple sets of duplicates and multiple matrix spikes within the batch

Create a QC batch for organics analysis, including surrogates.

Sometimes with an analytical batch, there is more than one matrix associated with the field samples, and so a set of duplicates and matrix spikes are included for each matrix. Can a duplicate and matrix spike be associated with a subset of samples within an analytical batch?

SUCCESS FACTOR #5

SCRIPTED DEMONSTRATIONS (EXAMPLE DAY #2 DETAILS)

Day 2
Demonstration Area: Workflow

Demonstration 12
Sample Receiving

Expected results:
BES staff will become familiar with LIMS functions associated with sample receiving.

Guidelines for presentation:

- Demonstrate LIMS functionality associated with sample receiving and log in including:
  - assigning sample identifier(s);
  - recording descriptive data about samples received (including default descriptive data associated with customer, project and sample location);
  - assigning analytical requests (which tests for which analytes) to samples;
  - assigning default analytical requests (which tests for which analytes) to samples associated with a customer or project;
  - changing default descriptive data or analytical requests for a sample;
  - assigning a priority for analysis;
  - assigning tests to be done by another lab;
  - identifying sample aliquots by bottle;
  - the methods of assigning a set tests to a group of routinely collected samples as well as to a set of non-routinely collected samples.

  Use one or more of the projects created for Demonstration 7, where appropriate.

Demonstration 13
Work Planning and Production

Background:
The WPCL's production specialist tracks work to be performed as well as work completed for all six departments at the WPCL (Process, General, Metals, Organics, Nutrients, and Microbiology). The Production Specialist, as well as chemists and analysts in each department, currently primarily rely on backlog queries and reports to manage work.

Expected results:

BES staff will become familiar with LIMS functions and features, in addition to queries and reports, available to facilitate work planning and production.

Guidelines for presentation:

Demonstrate LIMS functions and features available to the production specialist, chemists, and analysts to identify, plan, and track completion of analytical work.

Specifically demonstrate how, for a given sample with a number of different tests requested from different departments, the status is reflected when the tests are in various stages of completion.

Day 2 (continued)
Demonstration Area: Special Topics 2

Demonstration 18
Instrument Interfacing

Expected results:

BES staff will become familiar with the LIMS' capabilities for transferring sample information from the LIMS to lab instruments, as well as the LIMS' capabilities for collecting, processing and transferring data from lab instruments to the LIMS.

The staff will also gain an understanding of whether the WPCL would continue to use LimsLink as an instrument interface with the LIMS.

Background:

The WPCL has developed interactive worksheets using LimsLink (from Labtronics Inc.) to:

- query the LIMS to retrieve pending sample data for a test;
- record sample volumes, dilution factors, spike amounts, dish numbers, comments;
- transfer these data to an instrument run sequence;
- parse and collect data from instrument output or other files;
- collect data from balances, meters, and other direct measurement devices;
- collect data from multiple data sources into a single worksheet;
- process data
- track changes made to the data processing method;
- perform complex (inter-sample) calculations, such as matrix spike recovery;
- format data for import into the LIMS;
- document which chemists contribute to the analysis of a batch of samples;
- enforce rules of review (such as, analyst cannot review and approve their own results);
- allow review and approval of results before transfer to the LIMS;
- limit user access and activities (running tests, reviewing data) with security settings;
- provide an audit trail for changes to raw data.

Guidelines for presentation:

Demonstrate the LIMS' capabilities for transferring sample information from the LIMS to lab instruments, as well as the LIMS' capabilities for collecting, processing and transferring data from lab instruments to the LIMS. Consider the functions listed above that the WPCL can perform using LimsLink.

Specify if the LIMS capabilities for interfacing with instruments is available within the LIMS or is available as an optional module.

CONTRACT TO G0-LIVE

- VENDOR SELECTED LATE FEBRUARY 2010
- CONTRACT SIGNED MAY 2010
- ON SITE TRAINING ALL SUMMER OF 2010
- PARALLEL OPERATION WITH SNAPSHOT DATABASE FALL 2010
- GO-LIVE NOVEMBER 2010

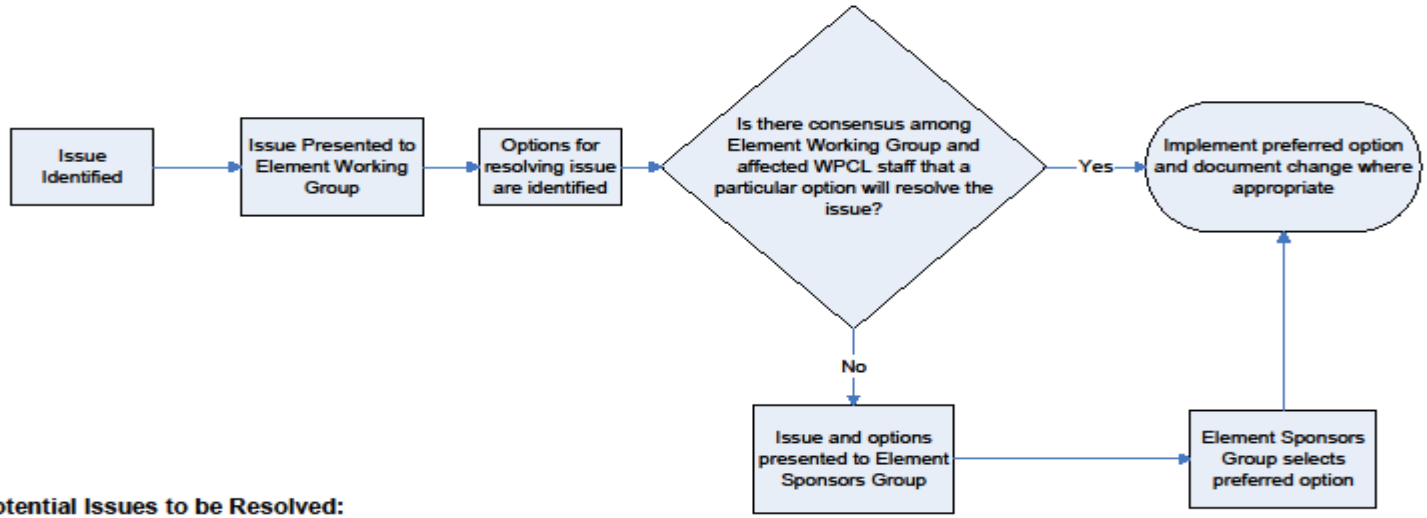
HOW DO WE KEEP IT ALL GOING WITHOUT HAVING A TRAIN WRECK??

SUCCESS FACTOR #6
THE RESPONSIBILITY MATRIX

- CREATED A LIMS WORKGROUP
- CREATED A FLOW CHART OF HOW WORKGROUP WILL FUNCTION
- UPDATED DETAILED LAB BUSINESS WORKFLOW
- MATRIX ENDS UP WITH 52 LINE ITEMS IN 6 GROUPINGS
  - UPSTREAM OF LIMS
  - ADMINISTRATION
  - OPERATIONS
  - MAINTENANCE & SUPPORT
  - DOWNSTREAM OF LIMS
  - IT INFRASTRUCTURE MAINTENANCE

OPERATION OF LIMS WORKGROUP

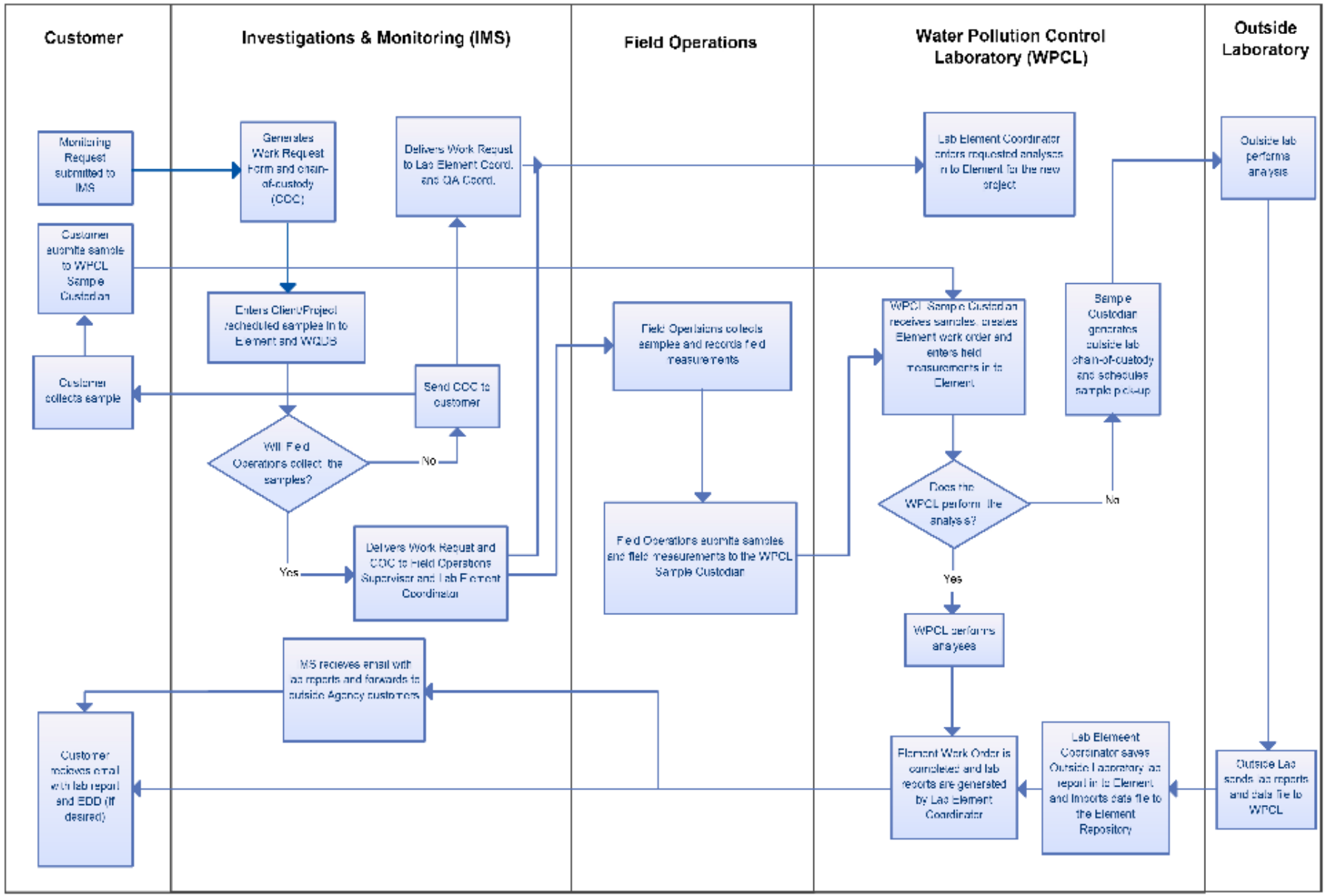
Element Responsibility Matrix Decision Flow Chart



Potential Issues to be Resolved:

1. **Changes in business rules**
2. **Changes in responsibilities**
3. **New or changed procedures to address new requirements or functionality**

LAB BUSINESS PROCESSES



FIRST TEN LINES OF THE MATRIX

	Topic Group	Topic	Task	Business Rules	Documentation (file location)	Lab Element Coordinator	MDAS Element Coordinator	IMS Element Coordinator	QA Coordinator
1.1	*Upstream of Element*	**Chain of Custody (COC) Forms**	Create and maintain COC forms	IMS will create all COCs except for the treatment plant COC which is managed by the QA Coordinator	Chain_of_custody.doc	X		X	
1.2	*Upstream of Element*	**Work Requests**	Create work request forms	IMS creates work requests for most projects including CSA. The Industrial Wastewater and Extra-strength programs create their own Work Request froms.	Work_Request.doc				
2.1	*Element Administration*	**Clients**	Create and maintain client information	IMS Element Coordinator will discuss new client name with Lab Element Coordinator to be sure that all agree on naming convention	Client.doc			**X**	
2.2	*Element Administration*	**Projects and Samples**	Create and maintain project information	IMS Element Coordinator will enter Project data including WQDB project_id or permit_id	Projects_and_Samples.doc			**X**	
2.2	*Element Administration*	**Projects and Samples**	Create and maintain scheduled sample information	IMS Element Coordinator will enter Scheduled Sample name and information including WQDB location_id.	Projects_and_Samples.doc	X		**X**	
2.2	*Element Administration*	**Projects and Samples**	Create and maintain analyses for scheduled samples	Lab Element Coordinator will enter requested analytes for each scheduled sample based on Work Request	Projects_and_Samples.doc	**X**			X
2.2	*Element Administration*	**Projects and Samples**	Create and maintain Unscheduled Samples	Sample Custodian will enter sample name and assign analyses as written on the chain-of-custody	Projects_and_Samples.doc	X			X
2.2	*Element Administration*	**Projects and Samples**	Create unscheduled sample locations in WQDB	IMS will create the location in the WQDB and provide it to the Lab Element Coordinator	Projects_and_Samples.doc			X	
2.3	*Element Administration*	**Analyses and Analytes**	Create and maintain analyses	Lab Element Coordinator will create and maintain all analyses.	Analyses_and_Analytes.doc	**X**			
2.3	*Element Administration*	**Analyses and Analytes**	Create and maintain analytes	Lab Element Coordinator will create and maintain all analytes.	Analyses_and_Analytes.doc	**X**			

"DOCUMENTATION" ACTUALLY MEANS A SET OF STANDARD OPERATING PROCEDURES

page 1

Water Pollution Control Laboratory
Element Responsibility Matrix Documentation
Project and Samples

Date Created: November 14, 2011 *(Revised September 27, 2012)*
Author: Peter Abrams

Introduction

Projects are second in the Element sample hierarchy, after Client.

Clients>> Projects>> Work Orders>> Samples

One or more projects can be associated with a client. All samples submitted to the lab need to be associated with a client and a project.

Tasks and Responsibilities

Task	Primary	Backup
Create new Standard Projects and samples	IMS Element Coordinator	Lab Element Coordinator and Sample Custodian
Create new CSA Projects and samples	IMS Element Coordinator	Lab Element Coordinator and Sample Custodian
Maintaining Project and sample Information	IMS Element Coordinator	Lab Element Coordinator and Sample Custodian
Create and maintain analyses for scheduled samples	Lab Production Coordinator	Lab Element Coordinator
Create and maintain analyses for unscheduled samples	Sample Custodian	Lab Element Coordinator

The IMS Element Coordinator will be responsible for creating new projects in Element. IMS will provide the lab with a "New Project" Work Request after the IMS Element Coordinator has created the project in Element. The Sample Custodian can create projects for the CSA section by using a project template called "Coordinated Site Analysis-Template" since this group regularly brings in samples for projects that have not been created prior to sample delivery.

The IMS Element Coordinator will be responsible for maintaining project data in Element. The Lab Element Coordinator and Sample Custodian will serve as the backup if project changes are needed and the IMS Element Coordinator is unavailable.

Current Business Practices and Supporting Documentation

By accepting task responsibilities, the primary and backup people agree to use the following business practices.

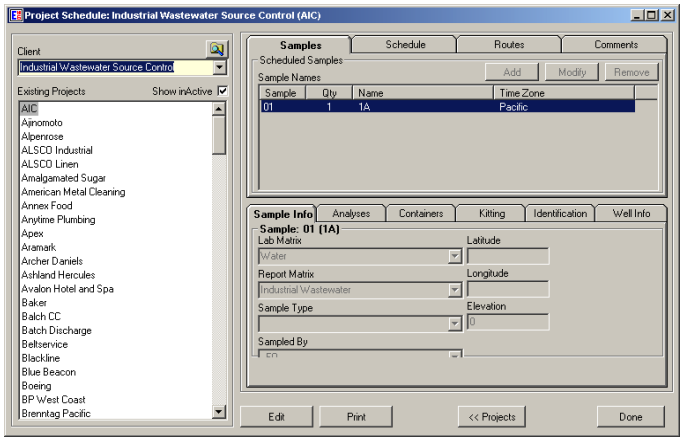
General Rules:

1. The project will be created under the Client that will be paying for the analyses (e.g., the project 'Johnson Creek ODOT Outfalls' was requested by the Sustainable Stormwater Section but is being funded by the Johnson Creek Watershed section; this project will be listed under the Johnson Creek Watershed client)
2. CIP Project Names should be used when feasible. Use the WBS# to find project in Piper (primarily CSA projects).

page 4

1. Add the sample and enter the Sample Name, this is equivalent to the sample point code (eg. 1A, TC01, 18_1, P5_3). This is the only info needed in the upper portion of the Project Schedule sheet.

NOTE: If sampling is a one-time event at the location do not create any "samples". The sample custodian will enter the sample names at login (i.e., Portland Harbor).



NOTE: Analyses can be assigned to the individual samples by the Lab Element Coordinator, see Analyses_and_Analytes.doc for details

2. Under the Sample Info tab:
   a. **Lab Matrix**, choose the most common matrix that will be collected. Sample custodian will adjust if matrix is different. Refer to the following document for help assigning matrices: \\oberon\LIMS_ELEMENT\Element_Administration\Sample_Control\Samples\Element_Matrices_Table.xls
   b. **Report Matrix**, choose "Industrial Wastewater" for industry samples and "Municipal Wastewater" for sanitary only samples.
   c. **Sample Type**, choose the most common sample type that will be collected.
   d. **Sampled By**, enter the one of the predetermined codes:

_FO	CoP_BES
_Plant	CoP_BDS
_CSA	CoP_PBOT
_SPCR	CoP Parks
_Outside Agency	CoP Water
_CSA/Consultant	_Consultant

3. Under "Identification" tab reenter the sample name in the Sample Alias field. This needs to match the assigned location code in the WQDB for data transfer.

CURRENT MAKEUP OF LIMS WORKGROUP

- LAB MANAGER
- LAB LIMS ADMINISTRATOR
- LAB PRODUCTION COORDINATOR
- LAB PROJECT MANAGER
- BES IT STAFF PERSON

EXAMPLE LIMS WORKGROUP AGENDA ITEMS/MINUTES

Element Core Team
Agenda for and Summary of Team Meetings

Agenda Items:

- CSA results and CSA database – storing analyte threshold limits in the Regulatory static tables
- CSA results and CSA database – testing Element results to be pushed to ArcGIS
- Analyte translation database: determine which resource to use for checking CAS numbers
    - http://www.inchi-trust.org/
    - http://www.iupac.org/home/publications/e-resources/inchi.html
    - http://ofmpub.epa.gov/sor_internet/registry/substreg/home/overview/home.do
    - http://cactus.nci.nih.gov/chemical/structure
    - http://webbook.nist.gov/chemistry/
    - http://www.chemspider.com
    - http://www.commonchemistry.org/
- **Truncate database**
- Changing CAS to ALS
- EDDs for DEQ
- Recording pH check verification for metals and other preparations?
- Maintenance on ElementServerFolders files
- BOD Meter
- Nutrients Interpreter
- Importing old congeners results to the WQDB? This will involve asking Jennifer for help ☺

Date	Topic	Outcome
4/23/15	Checking CAS numbers	Jennifer will do this soonish
	Threshold limits	Sam is adding more limit sets to the test system
	Testing Element SQL Query for CSA	Peter will complete the test plan and will work with Jennifer to identify any additional tests to add
	Database Truncation	Will begin planning in July and hope to be done by December
	Astoria Pacific software issue	Issue was resolved when BTS was given the Lab Service Network Documentation and they solved the problem.
	OI Interpreter	Kristen will change units on the instrument (in bigger units) and in Data Tool 'View >> Unit Cross Table" Sam will backup the DataTool cross tables. We backed up the Datatool files today.
4/16/15	Analyte Translation Database	\\besfile1\LIMS_ELEMENT\Element_Administration\Database_Admin\Static_Tables\Analytes\analyte.identifier.validation.xlsx Jennifer and Kristin will take a crack at reviewing and filling in CAS numbers and EPA ITN where necessary
	CSA Results and CSA Database – storing analyte threshold limits in the Regulatory static tables	Appears the limits can work in Element but we need to determine how often changes will need to be made. Do we need an audit trail?
	CSA Results and CSA Database – testing Element results to be pushed to ArcGIS	Csa.data.to.push.to.arc.gis, Sam would like some testing to be done to be sure the query is pulling info accurately. Peter will create a test plan in ElementTool.
	Review the data integrity report	Reviewed and resolved most issues

Date	Topic	Outcome
4/2/15	Analyte Translation Database	Sam will give the Element Core Team the list of popular compounds to double-check CAS numbers and other identifiers.
	CSA Results and CSA Database	Proof of concept to help generate reports with data compared to limits to eliminate copy and pasting over and over for each report. Sam will get us a list of the limits to add to Element for testing.

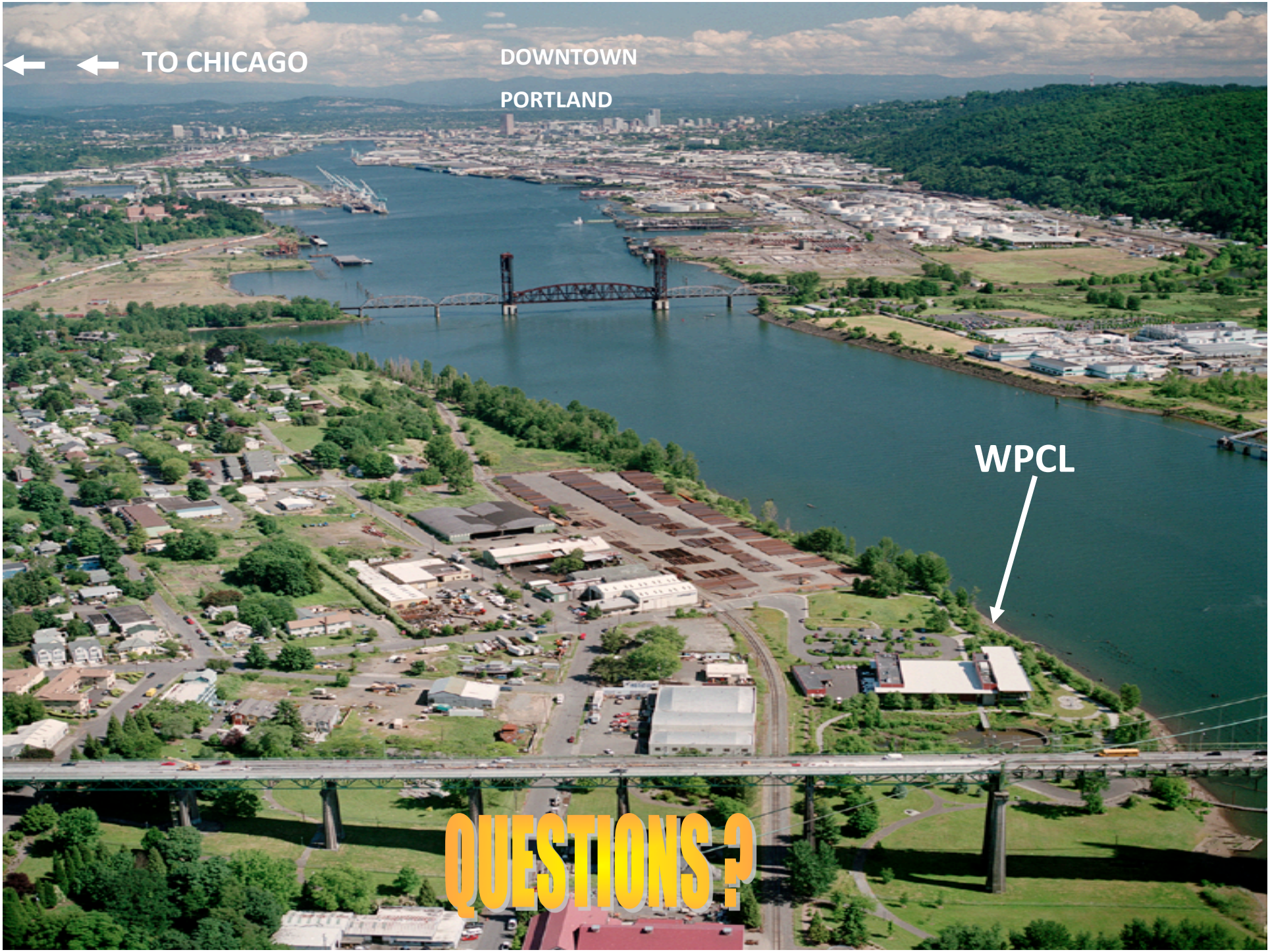
Date	Topic	Outcome

FINAL BOX SCORE

- ✓ LIMS CREATES QC REPORTS
- ✓ ELECTRONIC DATA UPLOAD INTO LIMS
- ✓ LIMS REPORTS & FLAGS RESULTS BETWEEN THE LOQ AND LOD (FOR EPA RPA ANALYSES)
- ✓ BAR CODING THROUGHOUT LAB
- ✓ SCANNED DOCUMENTS (COC, ETC.) UPLOADED INTO LIMS

REVIEW OF SUCCESS FACTORS

- HIRED A FULL-TIME IT/PROJECT EXPERT
- CURRENT WORKFLOW ANALYZED
- HIGHLY SCRIPTED RFP RESPONSES
  - TEXT ANSWERS & YES/NO/EXPLAIN FORMS
- HIGHLY SCRIPTED, TWO-DAY PRESENTATIONS
- SCRIPTED PRESENTATIONS/CLARIFICATIONS
  - GENERIC & VENDOR-SPECIFIC
- RESPONSIBILITY MATRIX
  - 52-ELEMENT MATRIX
  - 24 SOPs
  - ONGOING LIMS WORKGROUP


TO CHICAGO
DOWNTOWN
PORTLAND
WPCL
QUESTIONS ?