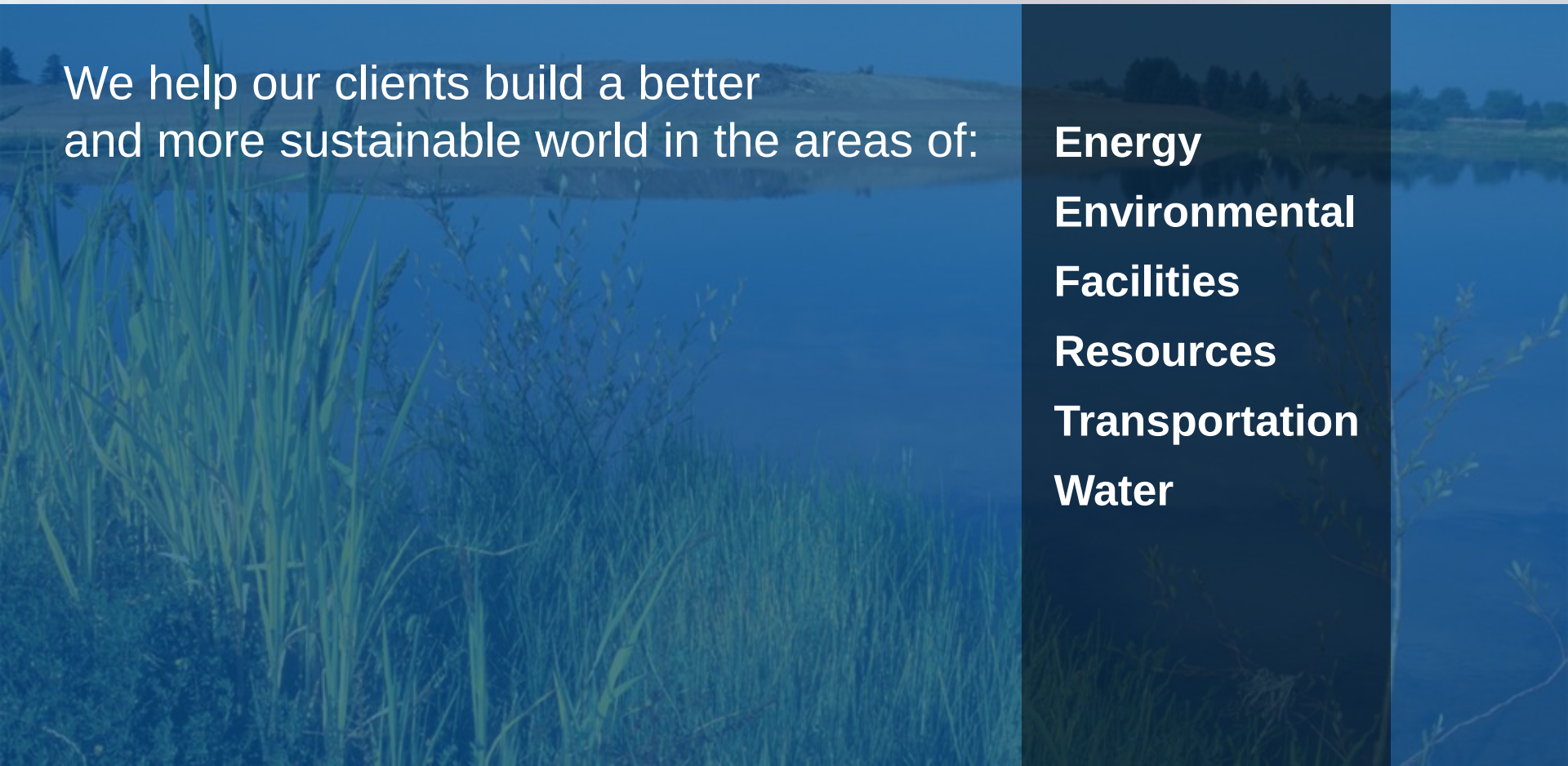
CH2MHILL®

Using EDGE to Correct Data Tracking Issues in the Field: A Case Study

Confidential Petroleum Site

CH2M HILL is a global leader

in full-service consulting, design, design-build, operations, and program management services.



We help our clients build a better and more sustainable world in the areas of:

Energy

Environmental

Facilities

Resources

Transportation

Water

Project Description

- Historic, and some active, exploration and production operations starting in the 1950s – 1960s.
  - Multiple lots (5-6) in the jungle covering a very large area
    - Lot 1 encompasses over 400 individual sites over a 60 mi^2 area
  - Multiple contractors and subcontractors working in area
    - Local residents at odds with various players and stage protests
  - Fast track sampling for remedial estimations for financial reasons
    - Soil (> 13K samples), sediment and surface (> 500 locations) water sampling.
  - Difficult working conditions, regulatory environment, and demands.

Project efficiencies are a must!

Potential for significant problems on a daily basis.

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The Site Conditions

Site Conditions

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Site Conditions

- Additional challenges
  - H&S
    - Significant slip, trip, fall hazards
    - Biohazards including venomous snakes, biting insects, noxious plants
    - Heat stress, high humidity and very wet conditions (and wet season is just about to start)
    - Remote working conditions with long travel times to sampling sites, and long hikes to sample locations.
  - Multiple sampling teams of 8 – 9 people
    - Drivers, drillers, trail blazers
    - Paramedics
    - Samplers
    - Field Team Lead (FTL) – CH2M Hill staff
  - Staff rotations and continual training of new staff

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Initial Field Data Collection

Field Data Collection

- Multiple subcontractors
  - Local regulations require specific ‘certified’ sample collection
  - Insurance issues
  - Oversight
- Base camp preparation
  - Pre-load forms with anticipated site information
- Differing sources of field data collection
  - Log books and handwritten field notes/forms
  - iPads with boring field forms
  - GIS surveyor
- Reconciliation of field data at base camp
  - COCs prepared with samples
  - Cross check data with iPads and GIS

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Field Data Collection

CADENA DE CUSTODIA / SUELOS, LODOS, BARROS Y SEDIMENTOS

FECHA DE MUESTREO : 23-08-2014
PERSONA DE CONTACTO : GLORIA COSCO
CLIENTE/ TELF. : CH2MHILL
LUGAR : FORE 12
PROYECTO : CARACTERIZACION LOTE 1AB

SDG N°: 08262014
ID Cadena de Custodia CH2M HILL: FO012-000-CC-T07001-MD823
N° de Grupo: 23761/2014
Hoja N° 01 de 01
Orden de Servicio N°: 14 - 597

ID Muestra (CH2M Hill)	Código de Laboratorio	Hora	Tipo de muestra (SS: suelo, SD: sedim., LD: lodo, BA: barro)	Georeferencia (UTM)	Envase (P: Plast., V: Vidrio)	N° de envases	Parámetros de Análisis de Laboratorio	Profundidad del Muestreo	Observaciones (color, olor, cuerpos extraños, etc.)
FO012-018-SS-BB-025-140823	261153	11:15	SS	370458/9741413	P,V	04		0.25 m	1626557
FO012-018-SS-BB-175-140823	261154	11:30	SS	370458/9741413	P,V	04		1.75 m	1626574
FO012-018-SS-BB-175-140823-DU2	—	11:35	SS	370458/9741413	P,V	04		1.75 m	
FO012-018-SS-BA-275-140823	261159	11:45	SS	370458/9741413	P,V	04		2.75 m	1626558
FO012-019-SS-BB-050-140823	261161	14:15	SS	370492/9741412	P,V	04		0.50 m	1626589
FO012-019-SS-BA-125-140823	261162	14:45	SS	370492/9741412	P,V	04		1.25 m	1626575
FO012-019-SS-BB-275-140823	261163	15:00	SS	370492/9741412	P,V	04		2.75 m	1626560

OBSERVACIONES:
QC/QA asociado:

TEMPERATURA de arribo Centro de Almacenamiento	5.8 °C	Visado (fecha / hora) 23/08/14 17:10	TEMPERATURA de arribo ANDCAS	1.5 °C	Visado (fecha / hora) 24/08/14 16:00	TEMPERATURA de arribo Laboratorio	1.75 °C	Visado (fecha / hora) 26/08/14 12:14

Muestreado por Corplab

Firma del responsable del muestreo
Nombre: RICARDO REYES CHISQUIPANTA
Fecha: 23-08-14 Hora: 15:10

Firma del supervisor en campo
Nombre: JUAN RAY ALMEIDA
Fecha: 23-08-14 Hora: 15:15

Firma de Recepción de Muestras
Nombre:
Fecha: 26/08/14 Hora: 12:02

Versión 01
Fecha de Revisión: 17/07/2014

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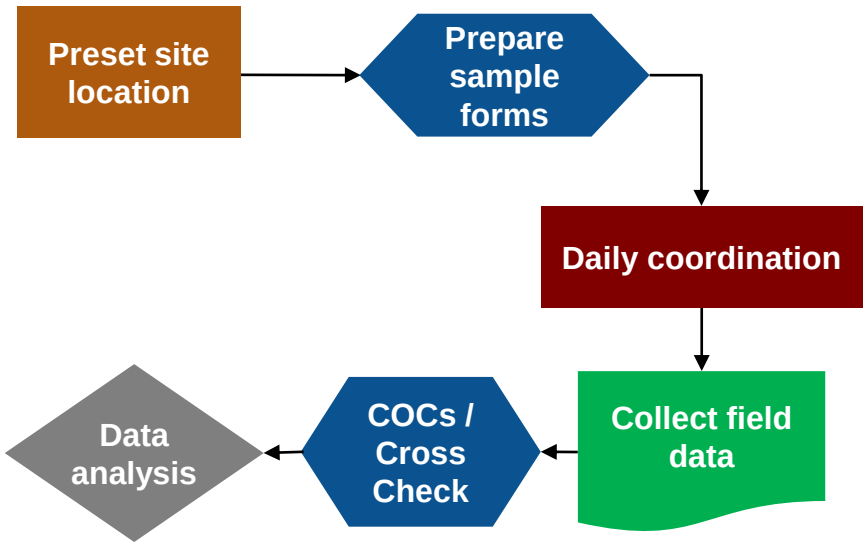
Field Data Collection

- Plan for least complex process
  - Contractor standard method
    - Familiar with process
- Site conditions changed standards
  - New processes
  - Rotating staff
- Multiple sources
  - Manual checking

Process



Multiple points for error entry, back end checking driving cost!

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The New Plan

New Plan

- Sample collectors ‘official’ source of data
  - Regulatory and maintain custody chain
  - Specific ‘certified’ entity
- Single source of data collection and transmission
  - Easy form for data collection
  - Electronic capture
  - Eliminate manual cross checks
  - Same source for electronic and printed custody
- Subcontractor demo
  - Forms and process
  - Testing
  - Training
  - Documentation

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EDGE Workflow

FieldSampleForm

Sampling Location Information

Well/Boring ID:	BART07_023_SS	Site:	BART07
Easting	1451263.2334	Northing	45132973.23

Sample Information

CH2M HILL Sample ID:	BART07_023_SS-SS-0-201411041043	Date	11/04/2014
Matrix:	SS	Time	10:43
Lab Sample ID:	126894261		
Start Depth	0	End Depth	50
Unit	cm	Type:	N
Field Crew:	Miguel Cabrera		
Composite?	N		
Composited Samples			
Observations:	Slight odor, brown staining		

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EDGE Workflow

CADENA DE CUSTODIA / SUELOS, LODOS, BARROS Y SEDIMENTOS

FECHA DE MUESTREO	2014/04/11	SDG N°:	
PERSONA DE CONTACTO	Miguel D.	ID Cadena de Custodia CH2M HILL:	
CLIENTE/TELF.	Joshua Clay/555-555-5555	N° de Grupo:	
LUGAR	Orun	Hoja N°	1 de 1
PROYECTO	BART07	Orden de Servicio N°:	

ID Muestra (CH2M HILL)	Código de Laboratorio	Hora	Tipo de Muestra (SS: suelo, CD: Sedim., LD: lodo, BA: barro)	Georeferencia (UTM)		Profundidad del Muestreo	Observaciones (color, cuerpos extraños, etc.)	Envase (P: Plast., V: Vidrio)	N° de envases	ANALYSIS REQUESTED: BENZO (B) FLUORANTENO	BENZO (GHI) PERILENO	BENZO (K) FLUORANTENO	CARBAMO (CB)								
BART07_023_SS-SS-0-20141104104 3	12e8942e1	10:43	SS	14512e3.233	4513297.3.23	50	Slight odor, brown staining	V,P	10	3	2	1	4								

OBSERVACIONES:

QC/QA asociado:

TEMPERATURA de arribo Centro de Almacenamiento	°C	Visado (fecha/hora)	TEMPERATURA de arribo ANDICAS	°C	Visado (fecha/hora)	TEMPERATURA de arribo Laboratorio	°C	Visado (fecha/hora)

Muestreado por Corplab

Firma del responsible del muestreo

Nombre:

Fecha: Hora:

Firma del supervisor en campo

Nombre:

Fecha: Hora:

Firma del Recepción de Muestras

Nombre:

Fecha: Hora:

Revisión 03
Fecha de Revisión: 04/11/2014

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EDGE Workflow (former handwritten)

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PERSONA DE CONTACTO: GLORIA COSCO
CLIENTE/ TELF.: CH2MHILL
LUGAR: FORE 12
PROYECTO: CARACTERIZACION LOTE 1AB

SDG N°: 08262014
ID Cadena de Custodia CH2M HILL: FO012-000-CC-T07001-MD823
N° de Grupo: 23761/2014
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EDGE Workflow

- Workflow Overview
- Loading EDGE and Format File
  - Choosing and setting forms
  - Export to EDGE Lite
- Completing Field Sample Forms
  - Cover input of data to all form fields
- Sync Data to EDGE
  - Sync field data to EDGE device
  - Saving EDDs and form information
- Transfer Data
  - Complete COC forms, print copy, distribute electronic copies
- Quality Review

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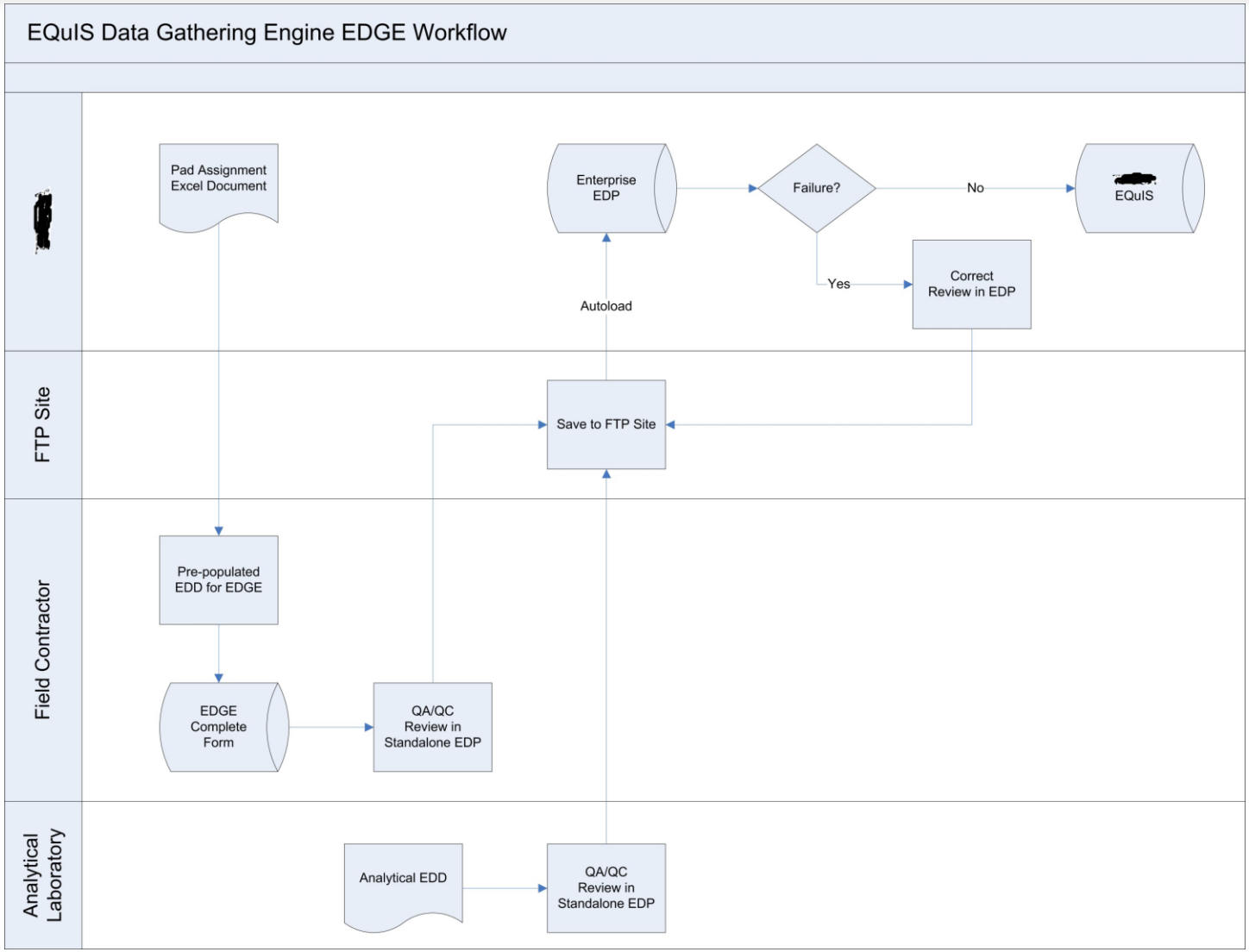
EDGE Workflow



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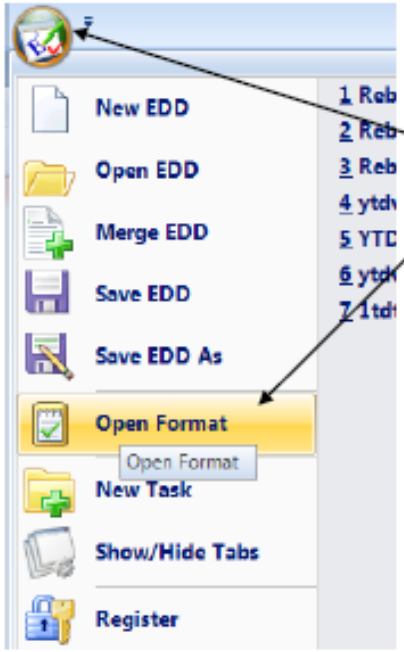
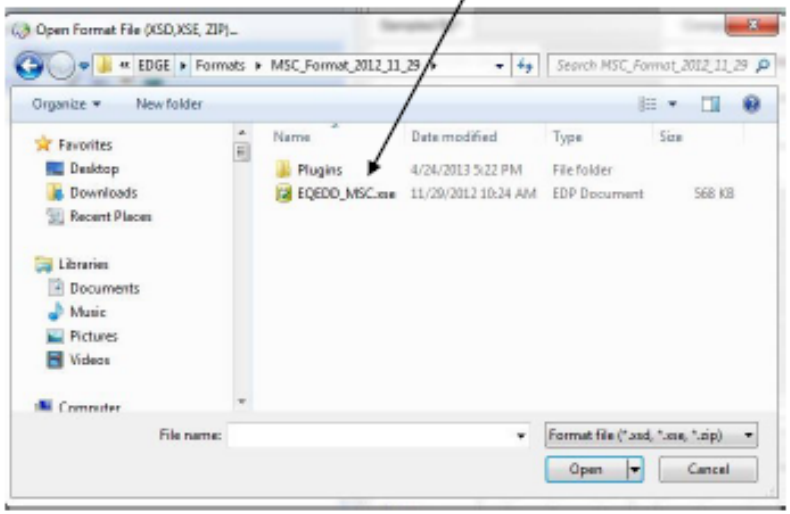
EDGE Workflow



1. Navigate to the directory within the flash drive where EDGE has been pre-installed
2. Click on the Start EDGE Icon shown on the left.
3. After EDGE has Loaded you will need to load the EDGE Format File.
4. Click the Icon in the top left hand corner of the application and select **Open Format.**
5. Navigate to the EDGE folder and select the **EQEDD_MSC.xse** file shown below:



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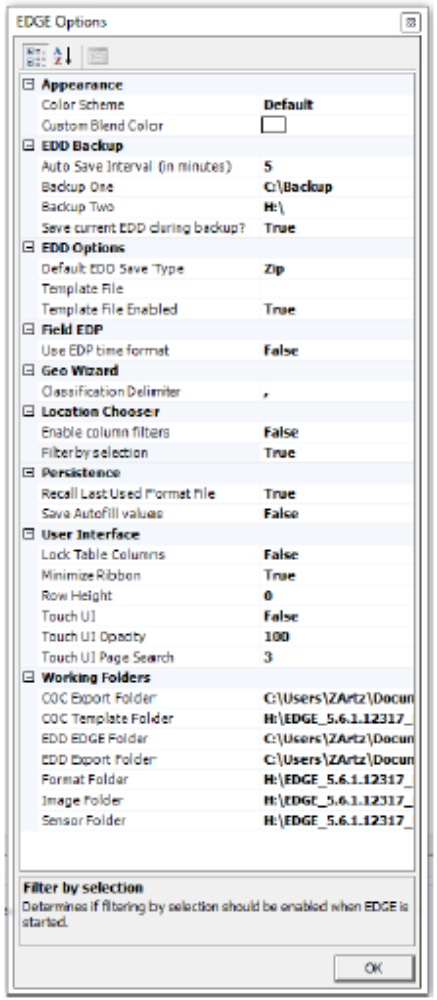
EDGE Workflow

2. Loading EDGE



Recommended settings for the options menu are as follows:

- Include sys_loc_code in eCOC: True
- EDD Backup
- Auto Save Interval: 5
- Backup One: Directory in your C:\
- Backup Two: Directory in your E:\ or removable device
- Default EDD save type: Zip
- When complete click OK

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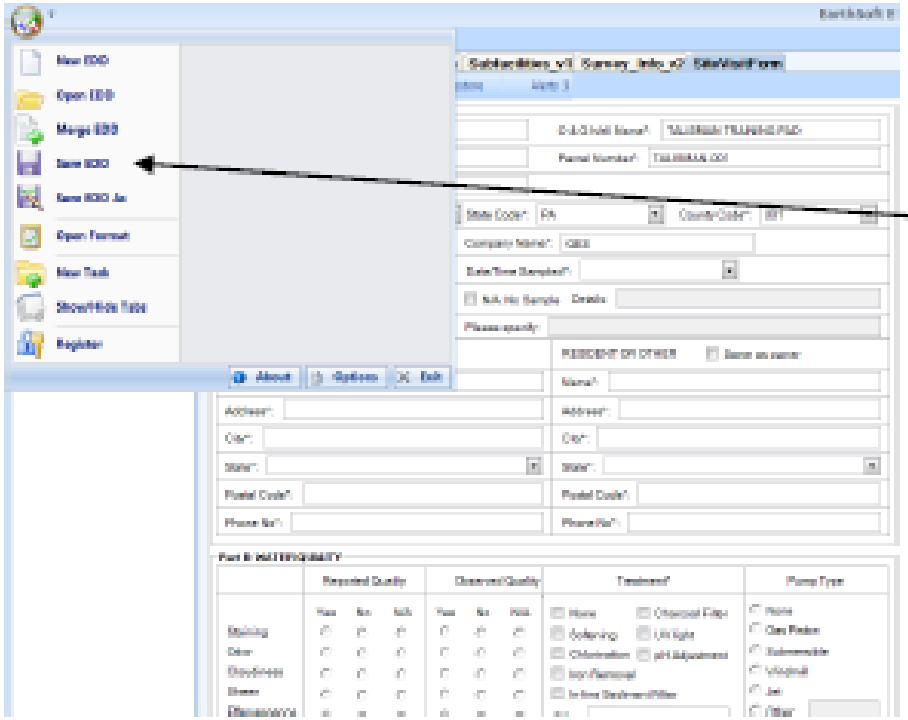
EDGE Workflow

3. Saving EDDs — Daily Task



1. As soon as the EDD loads all of the data for the Pad, click

   Save EDD

The EDD should be saved daily and for each sampler filling out forms. It will be helpful to maintain a local copy of the Template EDGE EDD as you will need to use this daily to create your daily EDD.

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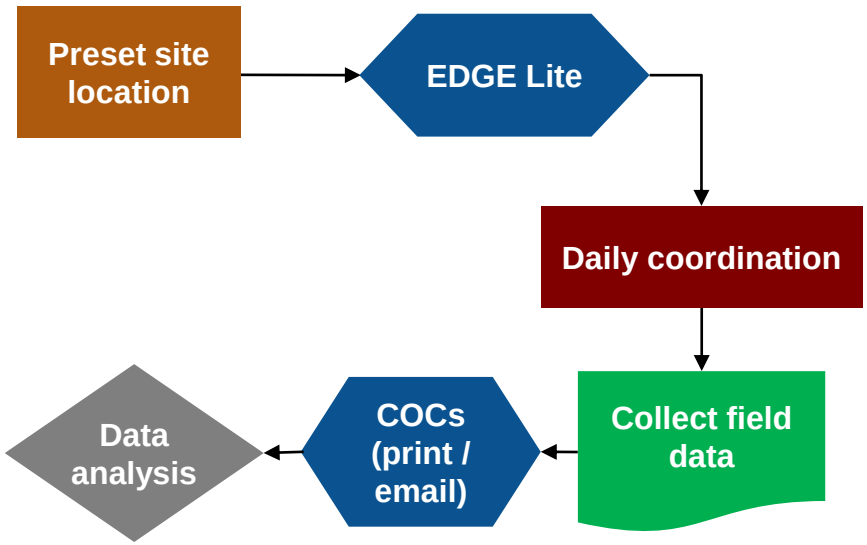
EDGE Workflow

- Plan for least complex process
  - New standard method
    - Field champions
- Site conditions considered / compensated
- Single official data stream
  - **Automated** checking
- Excitement among all!

Process



Efficiency up, costs going down, happy management and client!

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Discussion ?