



Exploring Future Opportunities for Digital Approaches in International Environmental and Social Impact Assessment

Presented to: IEMA GESA Group event
Presented by: Alistair Billington

Date: 21st May 2018

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IEMA Transforming the world
to sustainability

The business of sustainability



Welcome



A word cloud is displayed within a large, dark blue speech bubble shape. The words are in various colors (blue, green, orange, red, purple) and sizes, indicating their frequency or importance. The most prominent words include 'report', 'data', 'project', 'Nexus', 'reporting', 'App', 'field', 'client', 'managed', 'platform', 'point', 'system', 'process', 'element', 'launch', 'collection', 'integrated', 'all', 'carefully', 'managed', 'platform', 'point', 'system', 'process', 'element', 'launch', 'collection', 'integrated', 'all', 'carefully', 'managed'. Other visible words include 'standard', 'desktop', 'clients', 'like', 'ERMer', 'through', 'style', 'scene', 'insertion', 'here', 'make', 'multiple', 'version', 'think', 'One', 'authors', 'foundation', 'organisation', 'via', 'devices', 'heart', 'tracking', 'selecting', 'well', 'SharePoint', 'elements', 'document', 'Number', 'better', 'industry', 'looks', 'allow', 'Line', 'utilises', 'benefit', 'top', 'digital', 'now', 'PowerPoint', 'tablet', 'taster', 'systems', 'single', 'shared', 'mind', 'go', 'take', 'and/or', 'built', 'including', 'manage', 'teams', 'primarily', 'across', 'clicking', 'bot', 'form', 'environment', 'information', 'core', 'strong', 'storyboard', 'tool', 'achievable', 'own', 'manager', 'suggest', 'proprietary', 'Security', 'document', 'Number', 'better', 'industry', 'looks', 'allow', 'Line', 'utilises', 'benefit', 'top', 'digital', 'now', 'PowerPoint', 'tablet', 'taster', 'systems', 'single', 'shared', 'mind', 'go', 'take', 'and/or', 'built', 'including', 'manage', 'teams', 'primarily', 'across', 'clicking', 'bot', 'form', 'environment', 'information', 'core', 'strong', 'storyboard', 'tool', 'achievable'.

Faster, Better, Safer...

When something is important enough, you do it even if the odds are not in your favour

Elon Musk

Message from Martin Baxter

1. Overwhelming support for IEMA Petitioning for Chartered status. We have lodged the petition with the Privy Council and it's now in their hands. If all goes smoothly (fingers crossed) then we would anticipate being a chartered body by the end of the year.
2. Government has published its proposals for a new Bill on Environmental Principles and Governance. We're actively working (publicly and behind the scenes) to create a progressive governance framework for the UK. We're running some sessions and a webinar for people to get involved.
3. Many thanks to the GESA network for taking the lead on this initiative. It's vital that we make the most of technology and digital EIA is definitely a way to go.

Please turn on your phones!

Speakers



Alistair Billington,
Technical Director, ERM



Shana Westfall,
Technical Director, ERM



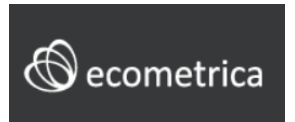
Polina Pimenova
Principal Environmental
Advisor, EBRD



Paul Ormerod, Director
at Lime Tools



Mark Cleverley, Head of
Public Sector Business
at Ecometrica



Programme

14:45: Registration

15.10: Welcome & Introduction (IEMA)

15.20: Part 1: Broadening the horizons for digital ESIA - Alistair Billington (Technical Director, ERM)

15:40: Part 2: Application of digital concepts to project lifecycle - Shana Westfall (Technical Director, ERM)

16:00: Part 3: Lender perspectives – A view on pros and cons for digital ESIA - Polina Pimenova (Principal Environmental Advisor, EBRD)

16:20: Part 4: Technology perspectives – Digital tools for behaviour change in IA - Paul Ormerod, Director at Lime Tools

16:40: Part 5: Technology perspectives – New approaches to ESIA - Mark Cleverley, Head of Public Sector Business, Ecometrica

17:00: Part 6: Panel Q&A Session – Questions to all presenters

17:25: Next steps and closing remarks

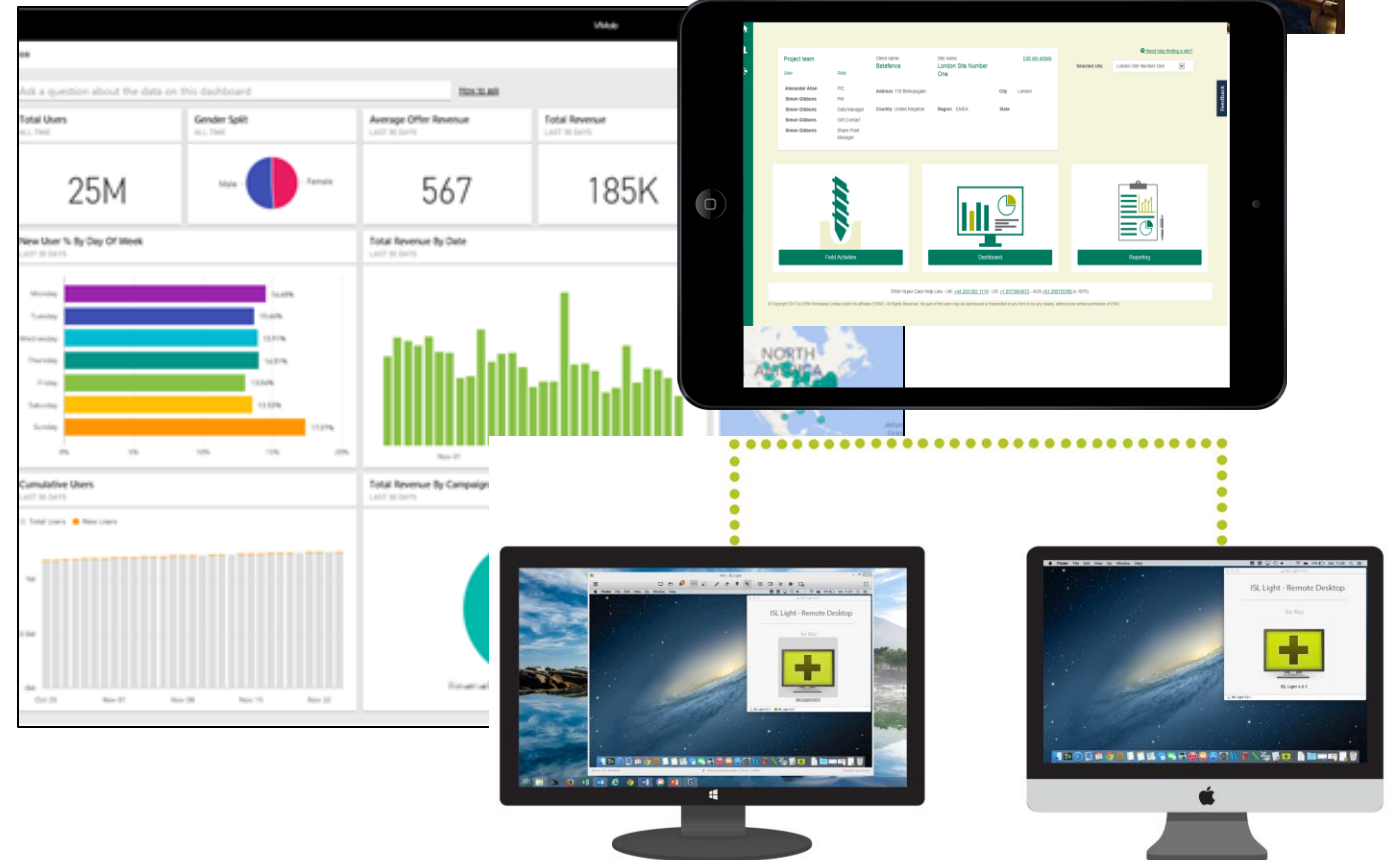


What do we want out of digital IA?

Benefits of digital opportunities in IA could include:

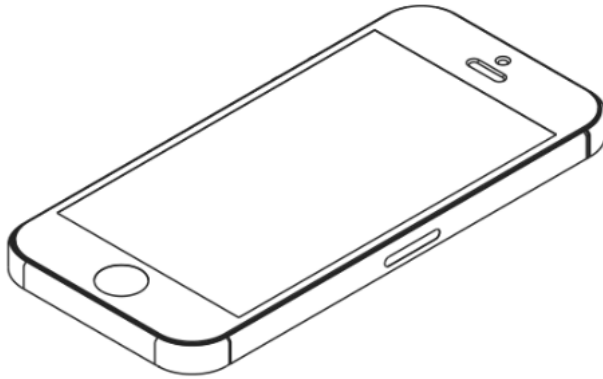
- Improved visibility of data
- Elimination of errors
- Single point of truth for the data
- Less time in the field
- Stakeholder customised reporting
- Shorter reports
- Complete data sets and expandable
- Faster turnaround
- Reduced cost of delivery
- Portfolio view and metric analysis
- Improved environmental and social due diligence (ease, speed, accuracy)

These fundamental needs for delivery of a successful project can help inform the structure and types of tools used in IA



Cast your vote!

Go to **www.menti.com** and use the code **61 44 12**



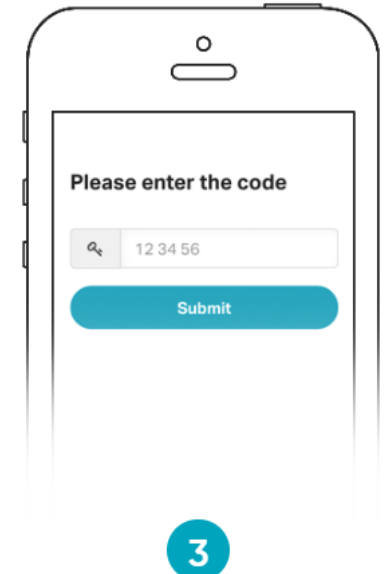
1

Grab your phone

www.menti.com

2

Go to **www.menti.com**



3

Enter the code **61 44 12** and vote!

provide style format graphics
analysis map projects template content
consultants supplement supported leverage
used approach online lengthy clients
narrative develop GIS efficiently process aid help
able directly lacks presented reflects traditional means report
Story CAD ERM generate avoids collected EQulS flexibility
other Given include text wanted web-GIS require
provides all immense much data Microsoft generated
dashboards new site opposed ESRI products useful important
client make allows present across pre-built
photographic regenerate engaging portal solutions using
well images word read assessment maps
multi-media seasonal rich easily written subject tool
dashboard more BI reporting PowerPoint
information

Contemporary Approaches

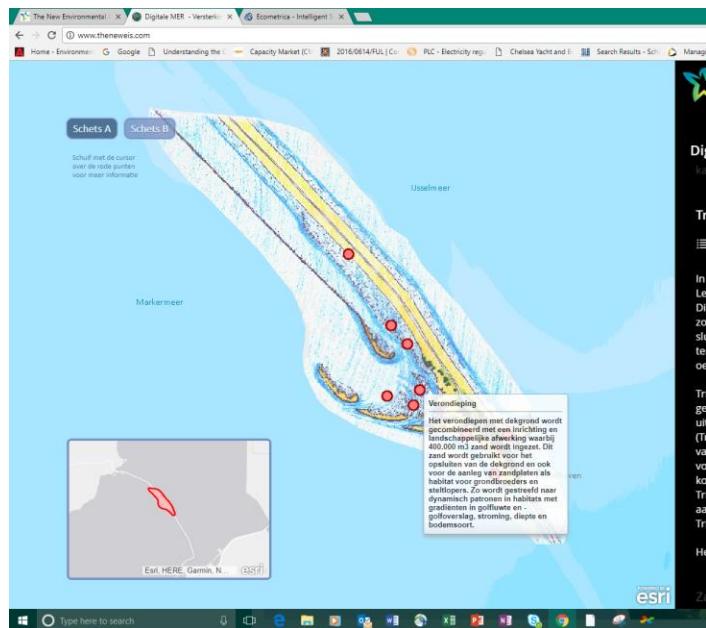
‘This report, by its very length, defends itself against the risk of being read’

Winston Churchill

Some Great Reporting Examples

Reinforcement of Houtribdijk - Digital EIS

Royal HaskoningDHV developed a new approach for sharing the complex information from an environmental impact report. Among other things, through visualisations, 360-degree images and animations, show the impact of the project on the environment.



Overzicht bouwstenen versterking Houtribdijk		
Categorie A: Bouwstenen ten behoeve van de waterveiligheid		
Bouwsteen	Toelichting	
A1	Overslagbestendig maken	Toepassen van harde bekleding op het binnentalud om erosie bij overslaand water te voorkomen.
A2	Dijkversterking met grond over gehele profiel	Aan één zijde worden de bekledingen verwijderd en vindt aan deze zijde de ophoging plaats in grond. Bovenop de ophoging wordt een nieuwe bekleding geplaatst.
A3	Verflauwing talud	Een verflauwing van het talud zorgt voor meer stabiliteit en verminderde golfloop en golfbelasting op de bekleding.
A4	Bekleding versterken	Versterken van de huidige, onvoldoende scorende bekleding door nieuwe, voldoende robuuste bekleding.
Categorie B: Bouwstenen met kansen voor natuurontwikkeling		
Bouwsteen	Toelichting	
B1	Luwtes	Dammen van zand en/of stortsteen, loodrecht op en parallel aan de Houtribdijk. De dammen hebben een golfreducerend effect (~20%).
B2	Langsdammen	Langsdam van zand en/of stortsteen op ca. 500 m afstand van de Houtribdijk. De langsdam heeft een golfreducerend effect (~40%).
B3	Zandplaten	Plaatsen van grote hoeveelheden zand op meerdere plekken langs de dijk. Het zand wordt door golfdynamiek verplaatst. De zandplaten hebben een golfreducerend effect (~20%).
B4	Moeras en MarkerWadden	Grootschalig moeras in het Markermeer zoals wordt gerealiseerd in het kader van Marker Wadden en TBES.
B5	(Beschermd) zandige oever	Aanbrengen van grote hoeveelheid zand tegen de dijk, met een flauw talud. De bouwsteen heeft een golfreducerend effect en zorgt voor dijksstabiliteit.
B6	Golfbreker bij teen	Aanleg van golfbrekers op NAP + 1 m op ca. 50-100 m van de dijk. Levert een bijdrage aan hoogteprobleem. De golfbreker heeft een golfreducerend effect (~90%).
Categorie C: Bouwstenen met betrekking tot beheer en onderhoud		
oeverrecreatie aan de IJssmeerkant bieden bij trintelzanden.		
Trintelzand is een subvariant op de Varianten 1 of 2 en betreft alleen het gedeelte bij en ten noorden van Trintelhaven. Het plan voor de subvariant is uitgewerkt in een beperkte (Trintelzand A) en een uitgebreidere vorm (Trintelzand B). Ten behoeve van de effectbeschrijving in het MER is uitgegaan van een maximale invulling van Trintelzand B. Voor een visualisatie van beide vormen klik hier . Trintelzand A is zo ontworpen dat het in de basis kostenneutraal is in vergelijking met het basisonwerp voor Varianten 1 en 2. Trintelzand B gaat om het toevoegen van extra kwaliteit en ook extra oppervlak aan habitats. Voor informatie over oppervlaktes en grondverzet klik hier . Trintelzand past binnen het planologisch kader .		
Het volgende filmpje geeft een globale impressie van variant 1 met Trintelzand.		
Zandwinning en uitvoering		



Information
Contact
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Digitale MER - Versterking Houtribdijk

aangegeven. Door te klikken op de kaart is een eventuele relatie (of cumulatieve effecten) met de Houtribdijk te lezen.

Voorselectie oplossingen (uit de verkenningenfase)

[Ga terug naar inhoudsopgave.](#)

In 2013 en 2014 heeft Rijkswaterstaat in een aantal stappen een voorselectie van mogelijke oplossingen gemaakt en een voorkeursalternatief gekozen. Bij deze voorselectie zijn technisch mogelijke oplossingen (bouwstenen) bekeken die een bijdrage leveren aan de doelstelling van het project en is gekeken welke daarvan kansrijk zijn. Er zijn 3 categorieën bouwstenen gericht op de veiligheidsopgave, natuurontwikkeling en beheer en onderhoud. Van de geselecteerde kansrijke bouwstenen zijn kansrijke oplossingsrichtingen samengesteld. De kansrijke oplossingen zijn beoordeeld op milieueffecten en onderling vergeleken. Vervolgens is uit de kansrijke oplossingen het voorkeursalternatief gekozen. Binnen dit voorkeursalternatief worden twee varianten onderzocht.

Er is in de Notitie reikwijdte en detailniveau ook aandacht gevraagd voor maatregelen gericht op peilbeheer (inzet van pompen). Deze oplossing is in het MER niet verder uitgewerkt. Klik [hier](#) voor een toelichting.

Stap 1

Stap 2a

Stap 2b

Opstellen bouwstenen

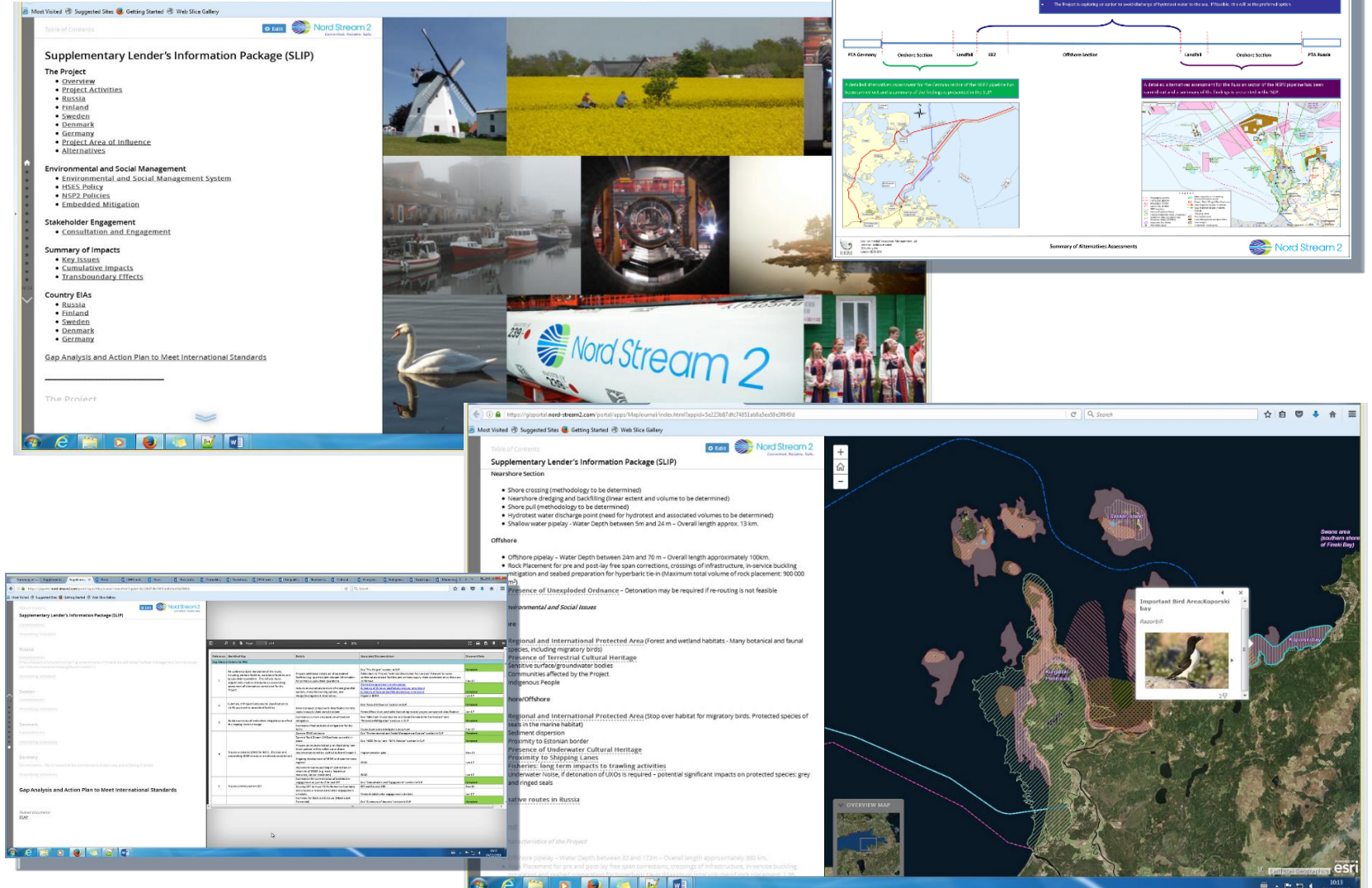
Selectie kansrijke bouwstenen o.b.v. projectdoelstellingen

Samenstellen kansrijke oplossingsrichtingen

Some Great Reporting Examples

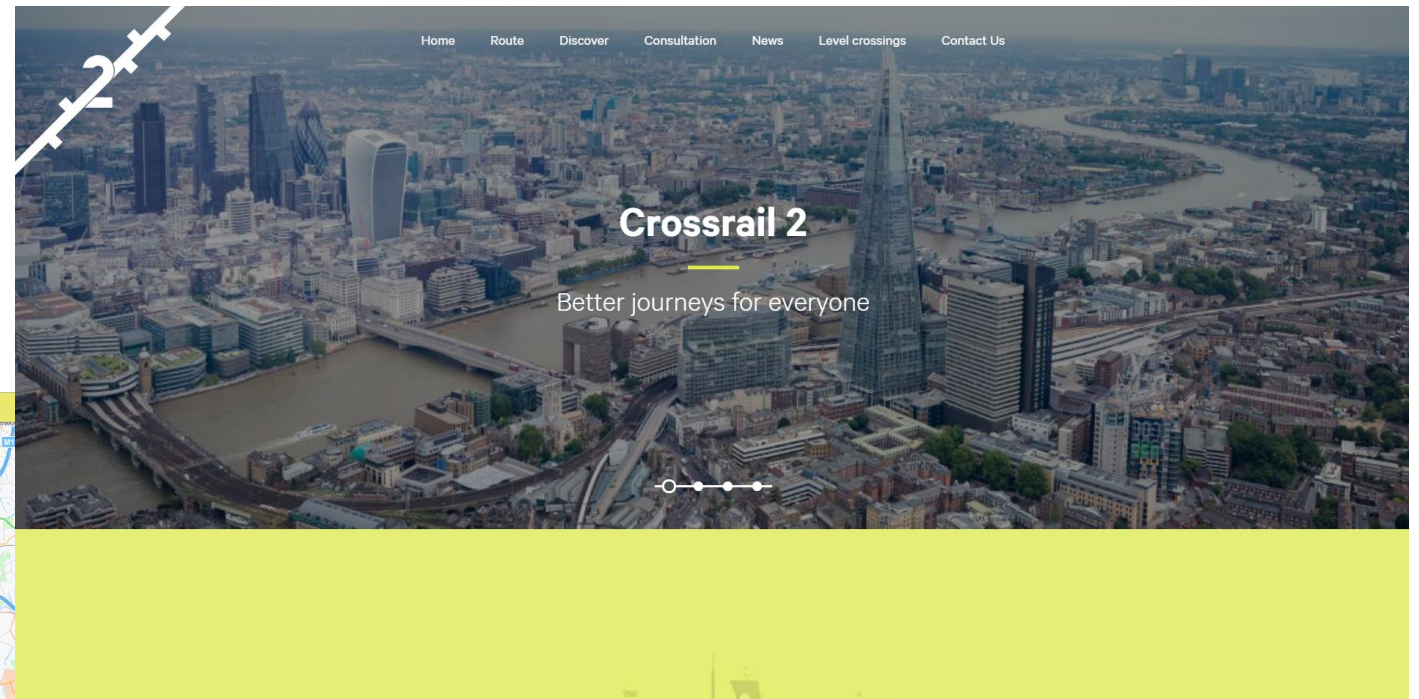
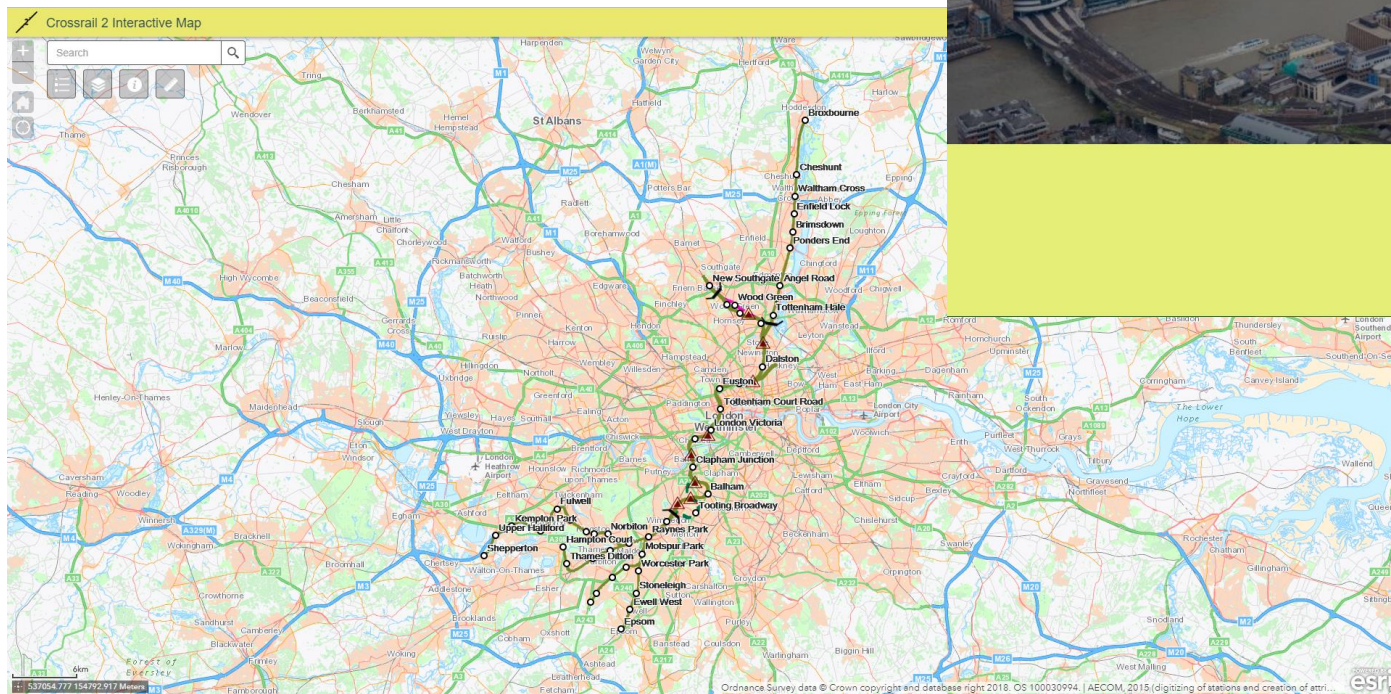
Nord Stream 2: Digital Supplementary Lenders' Information Pack (SLIP)

To facilitate lender review and compliance with international finance standards, ERM was commissioned to review the draft impact assessments being prepared in each country and conduct a gap analysis against both national regulatory requirements and IFC Performance Standards. ERM then worked with NSP2 to develop an environmental and social action plan to address all identified gaps between the work already completed and what will be expected by the lenders. ERM then prepared an innovative, web-based Supplemental Lenders' Information Package (SLIP) to help prospective lenders understand the environmental and social risks/impacts associated with the Project and how NSP2 plans to effectively manage these issues in-line with international guidelines/standards. Note: because this was prepared for lenders only, it is not a publically available document.



Some Great Reporting Examples

Crossrail 2: Digital Scoping Report



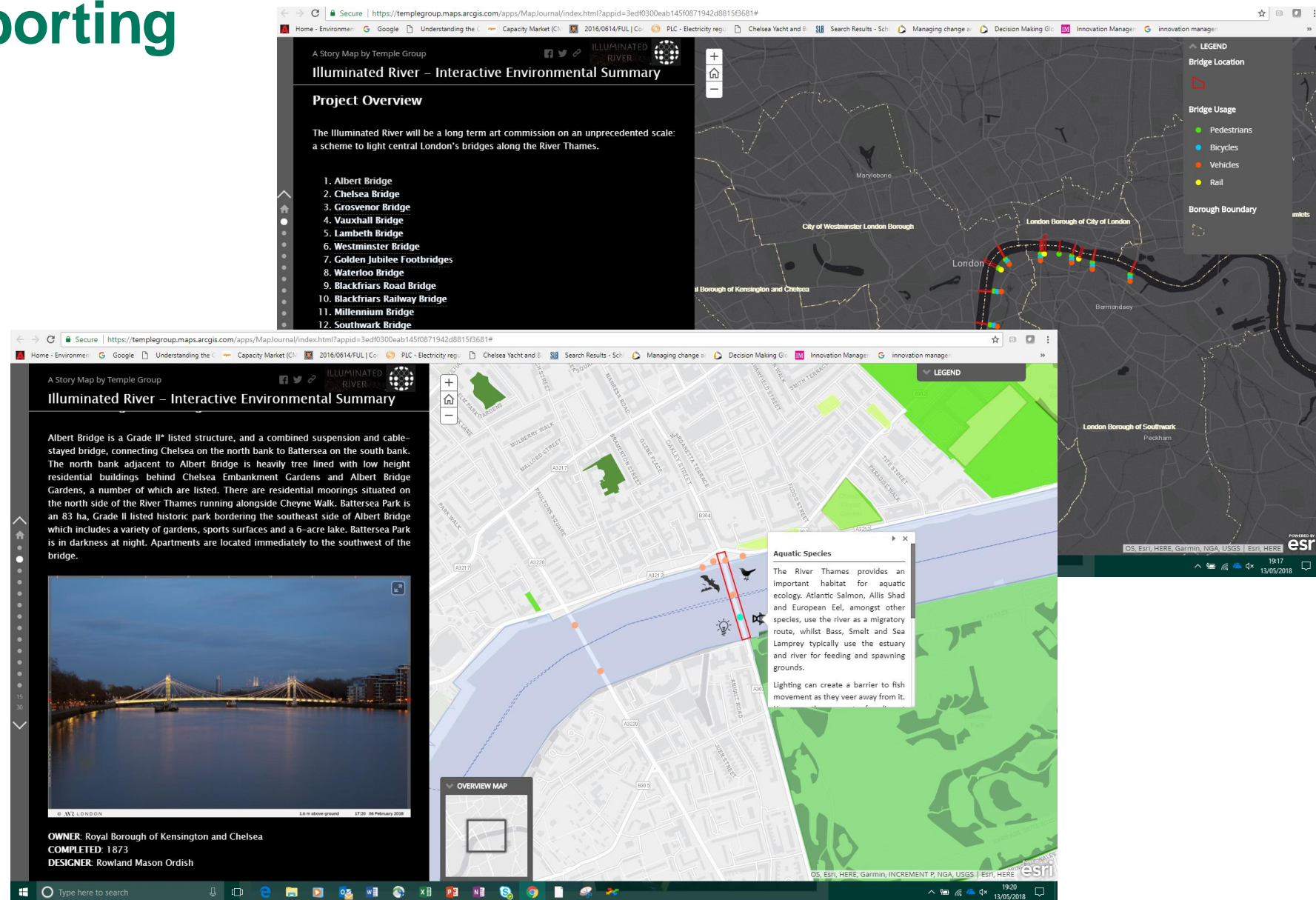
Some Great Reporting Examples

Illuminated River Project: Interactive Environmental Summary

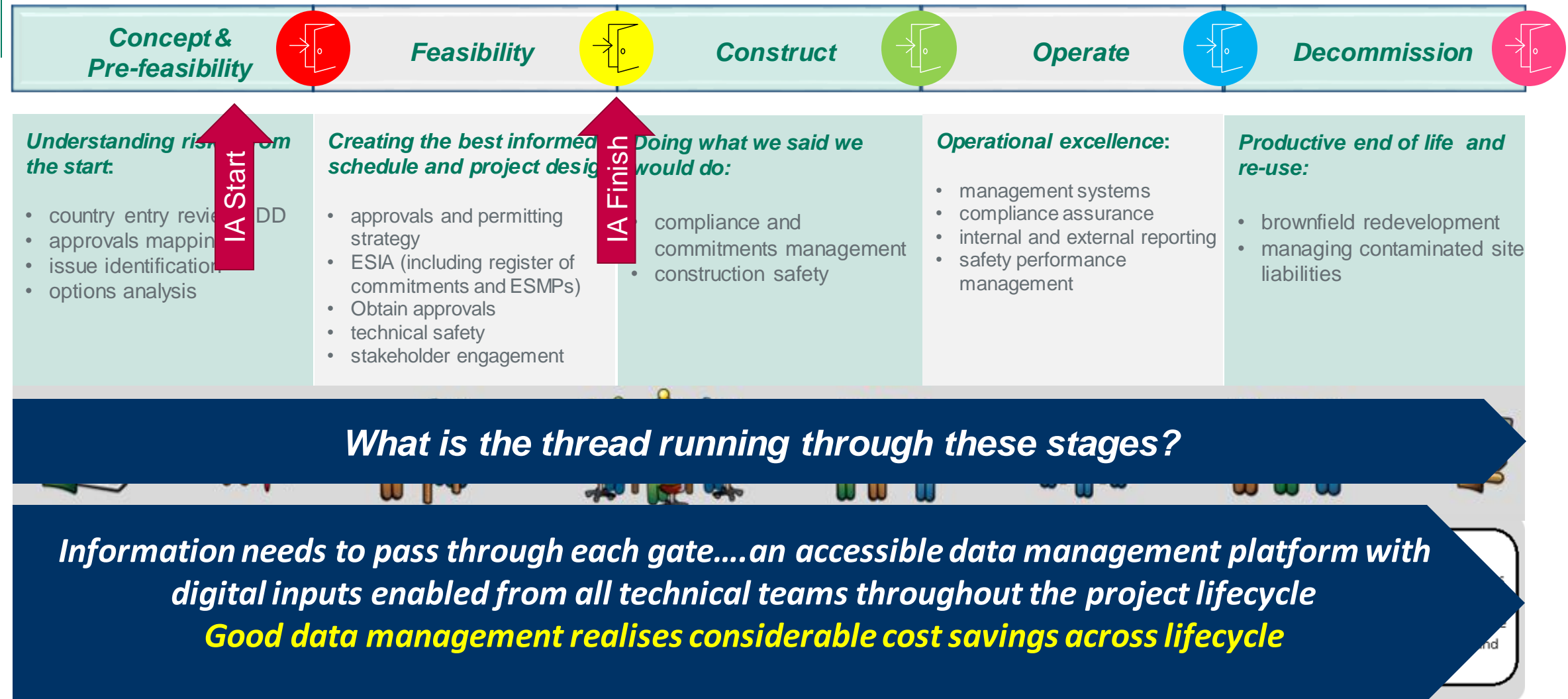
The Illuminated River Project, the longest art commission in the world. 15 bridges along 4.5 nautical miles of the River Thames will be illuminated with kinetic light from Albert Bridge in the west to Tower Bridge in the east.

Temple is the project EIA consultant, and to accompany the statutory Environmental Statement, Temple have produced an Interactive Environmental Summary (IES). This tool is one of the first of its kind and marks an important step towards presenting the environmental information contained within the Environmental Statement in a much more interactive and user-friendly format.

Interested members of the public and project stakeholders can engage with information about the nature of the artwork and its environmental impacts and benefits as a series of interactive maps and visualisations, rather than trawling through several volumes of text heavy reports. The tool includes videos of the proposed artwork on each bridge to enable the user to understand the concept and dynamic visual nature of this exciting project.

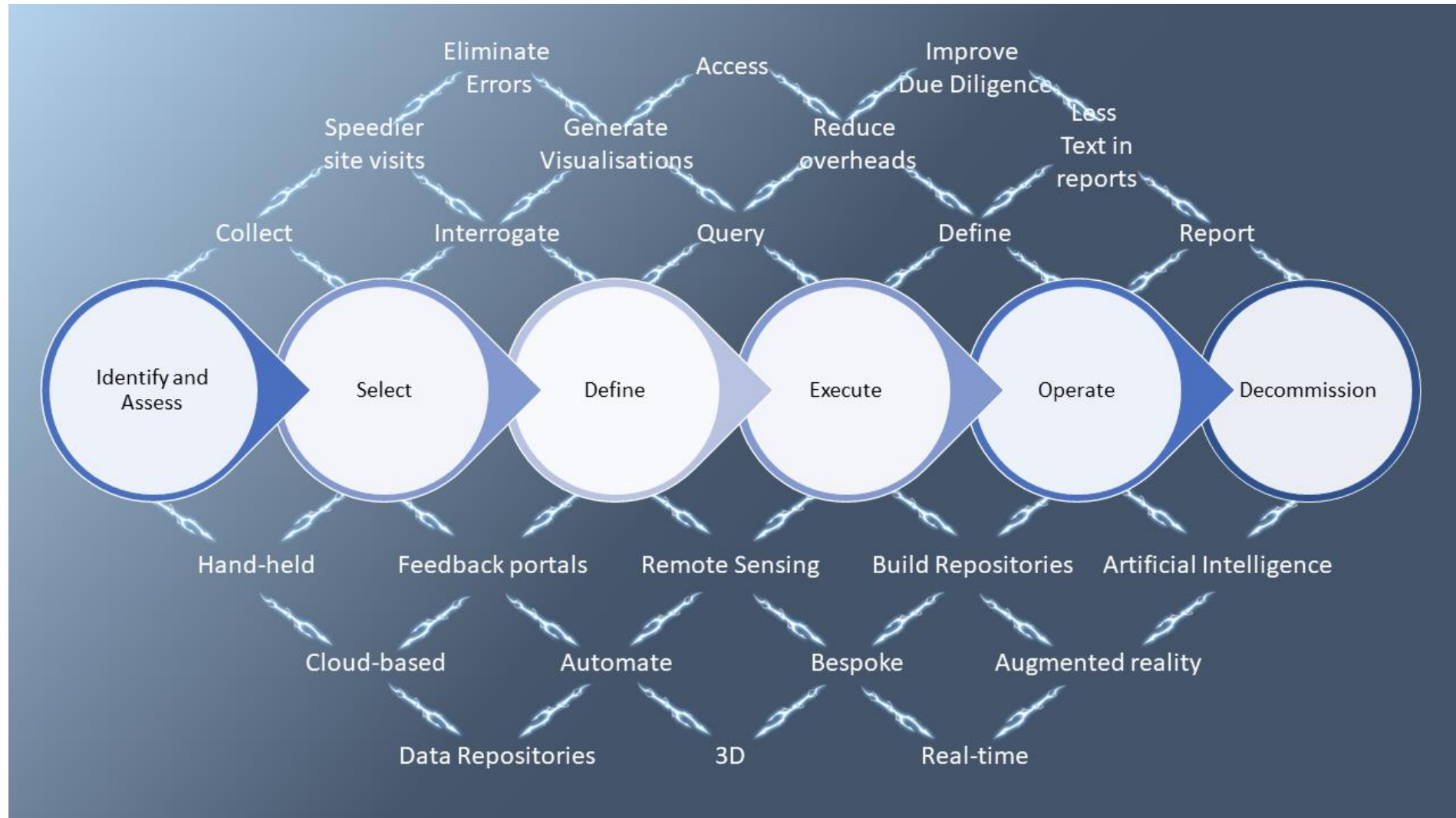


Project Lifecycle

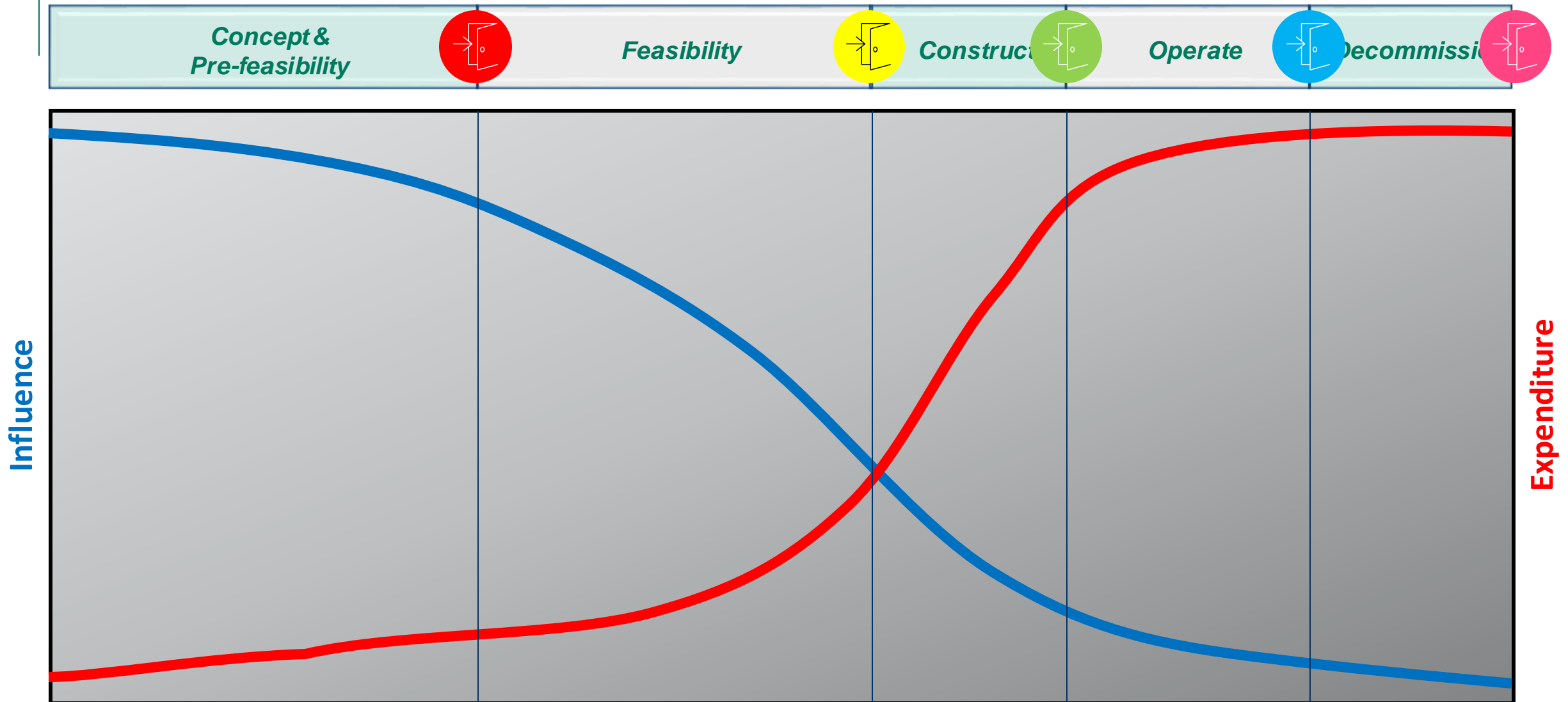


Impact Assessment

Digital Opportunity Areas – Stage Gates



Influence versus Expenditure

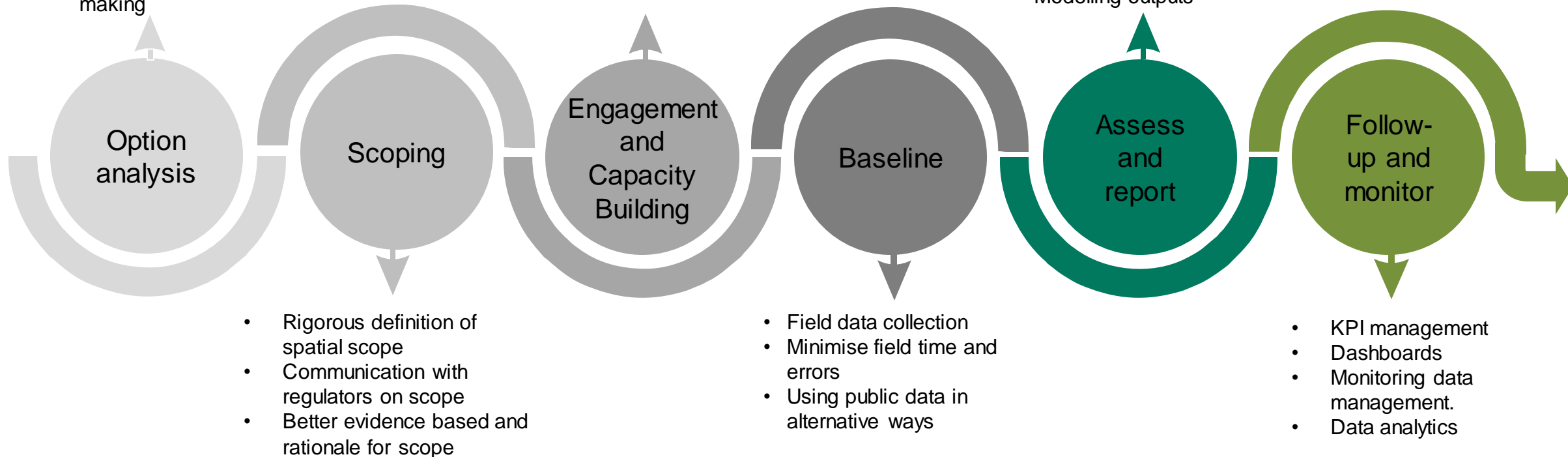


Digital Opportunity Areas – ESIA Activities

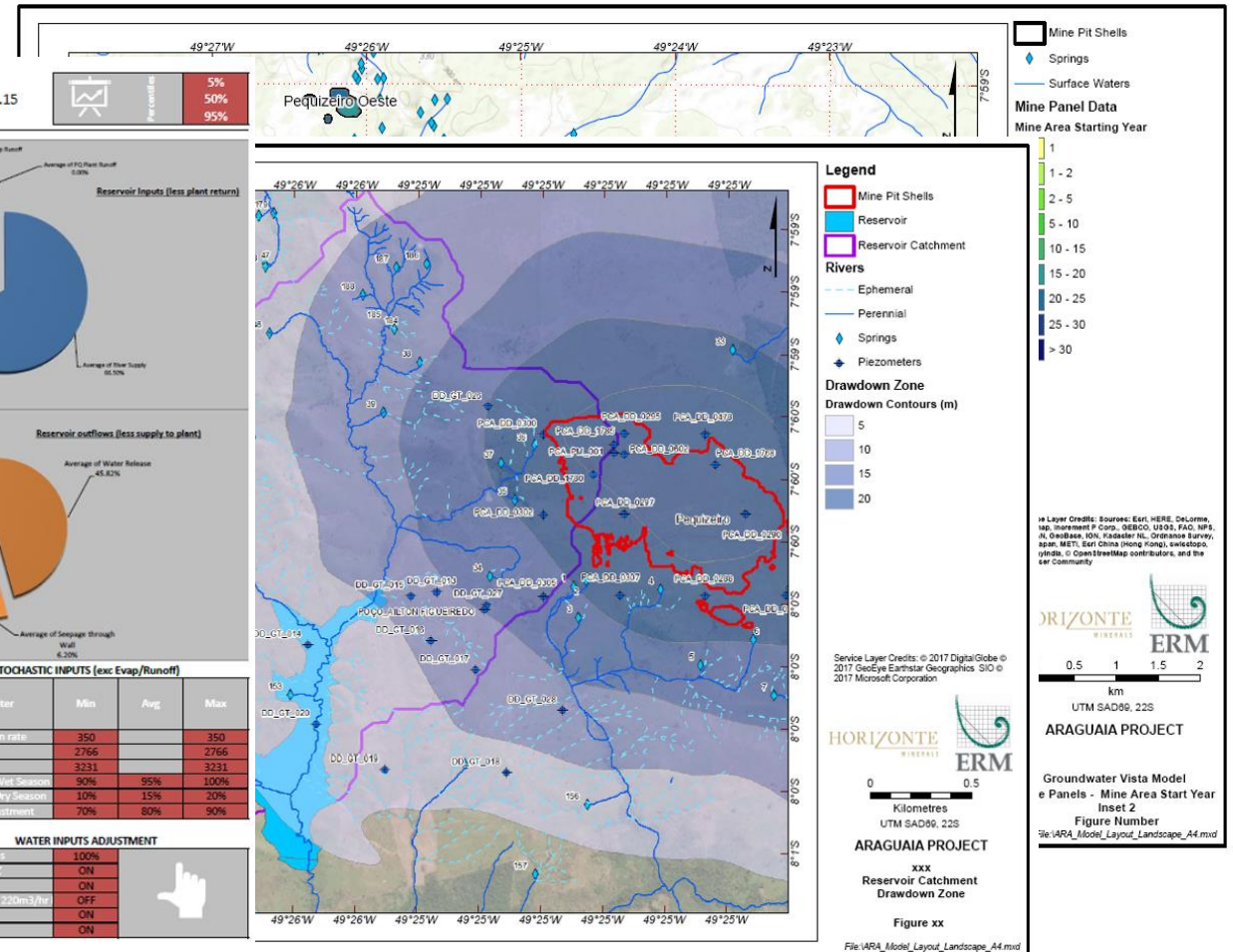
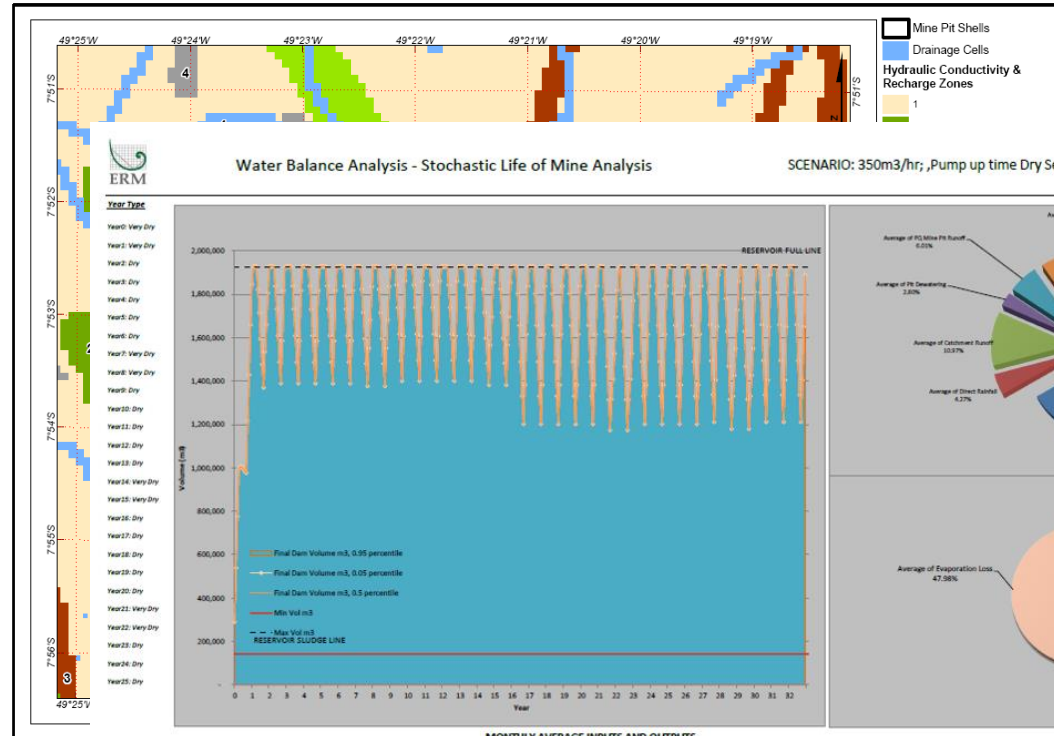
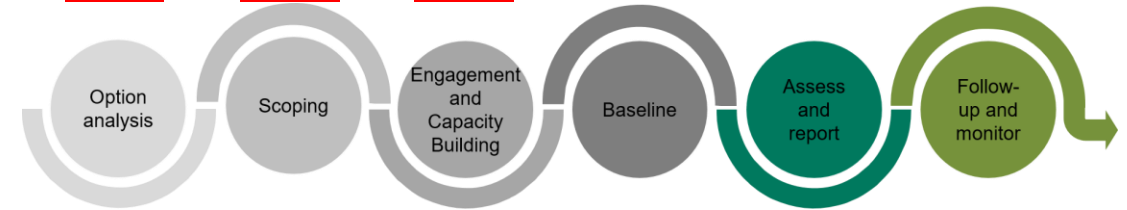
- UAVs
- Using free data to identify red flags:
 - Early resource management
 - Infrastructure siting
 - Capturing decision making

- Capacity building
- Active grievance management
- Different experiences for different audiences.
- Customised NTS, Scoping Report, ESIA Report.

- Data analytics
- Visual representations
- 3D experiences
- Interactive reports that are audience focussed.
- Modelling outputs



Option Analysis

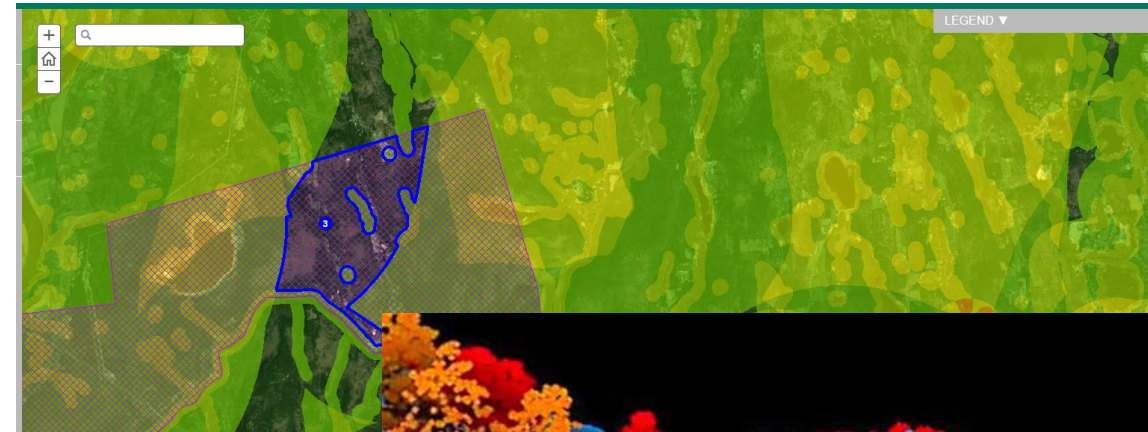
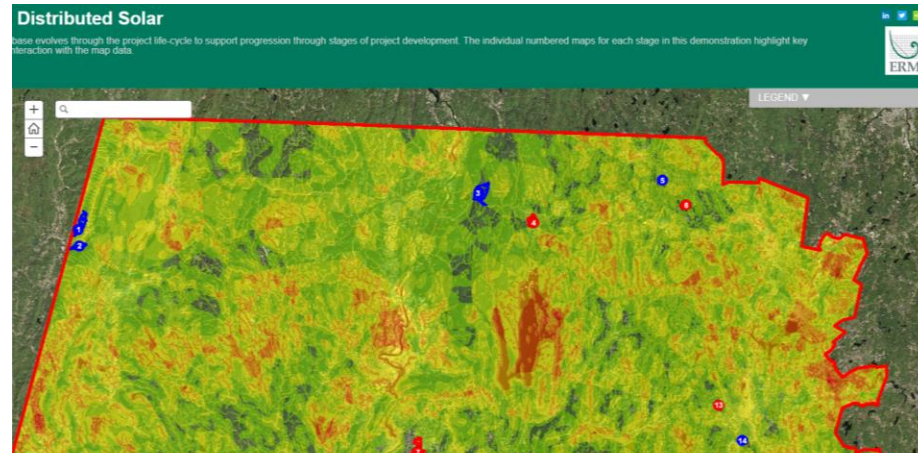
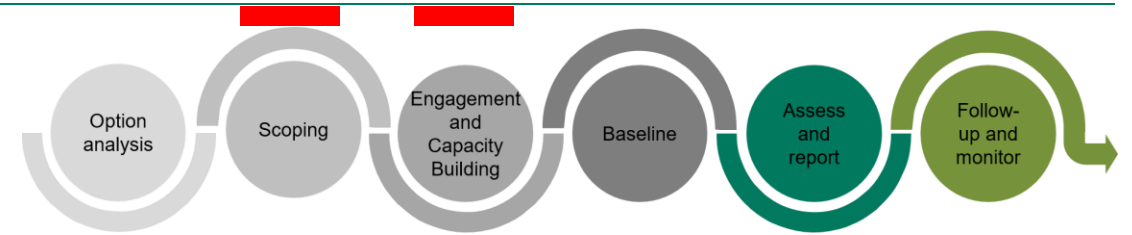




Fieldwork Preparation

“In God we trust. All others must bring data.”
W. Edwards Deming, statistician, professor, author, lecturer, and consultant.

Scoping

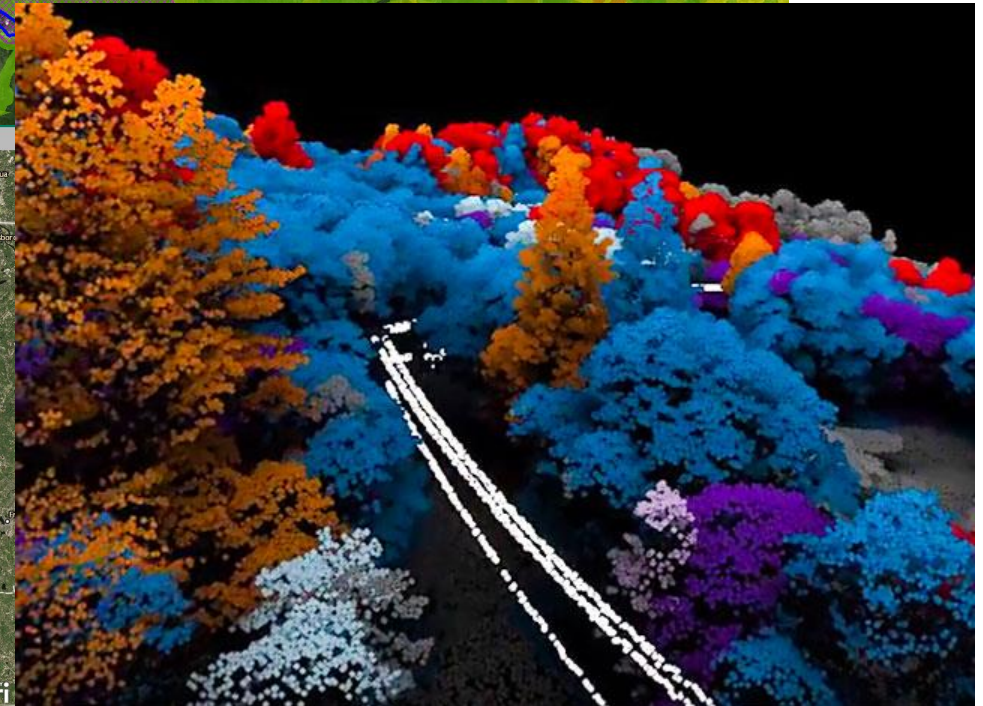
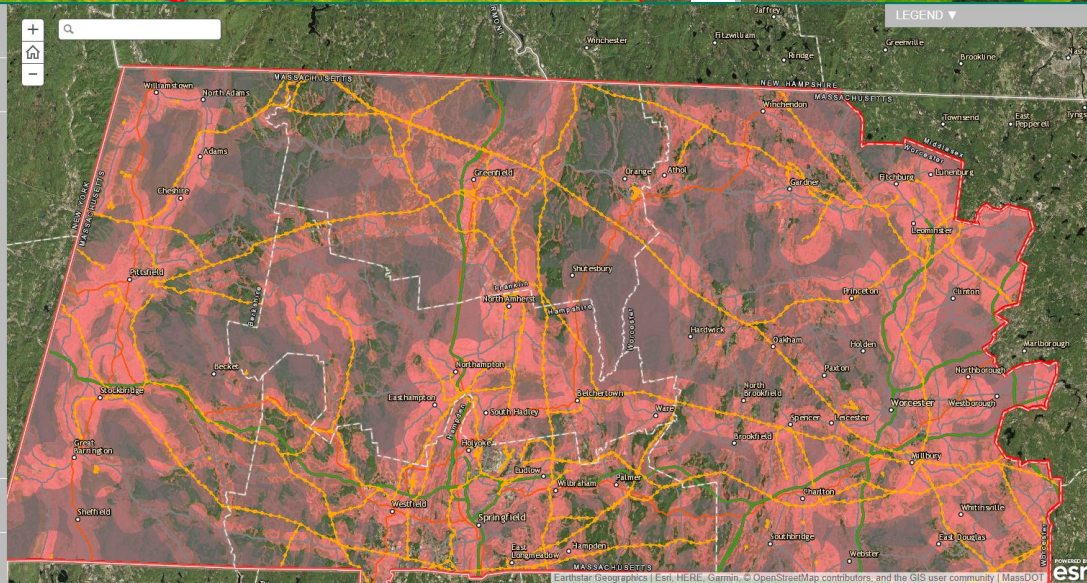


- 1 Identify Project Area
- 2 Collect Baseline Data
- 3 Define Development Constraints

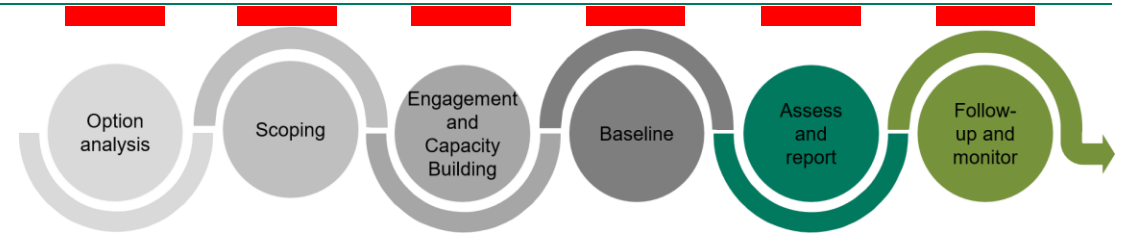
Many layers of baseline information can be challenging to interpret rapidly to identify suitable sites for further evaluation. Using GIS to convert the data into a simplified constraints format aids visualization and rapidly eliminates unsuitable locations.

In this example the map shows both technical limits on construction in black (e.g. proximity to utility connections) and non-technical risks to successful permitting and development in red (e.g. outside wetland buffer zone). Areas with no constraints are clear.

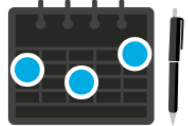
The GIS viewer now shows aerial photography as part of the background enabling more detailed review of potential sites. Additional options for site suitability comparison and selection are shown on Map 4.
- 4 Select Alternative Sites
- 5 Coordinate ESIA



3D, 4D, 5D, 6D and 7D



4D Time / Schedule



5D Cost



6D Operation / Maintenance



3D

- Existing Conditions Models
- Laser scanning
- Ground Penetration Radar (GPR) conversions
- Safety & Logistics Models
- Animations, renderings, walkthroughs
- BIM driven prefabrication
- Laser accurate BIM driven field layout

4D

- SCHEDULING**
- Project Phasing Simulations
 - Lean Scheduling
 - Last Planner
 - Just In Time (JIT)
 - Equipment Deliveries
 - Detailed Simulation Installation
 - Visual Validation for Payment Approval

5D

ESTIMATING

- Real time conceptual modeling and cost planning (DProfiler)
- Quantity extraction to support detailed cost estimates
- Trade Verifications from Fabrication Models
 - Structural Steel
 - Rebar
 - Mechanical/Plumbing
 - Electrical
- Value Engineering
 - What-if scenarios
 - Visualizations
 - Quantity Extractions
- Prefabrication Solutions
 - Equipment rooms
 - MEP systems
 - Multi-Trade Prefabrication
 - Unique architectural and structural elements

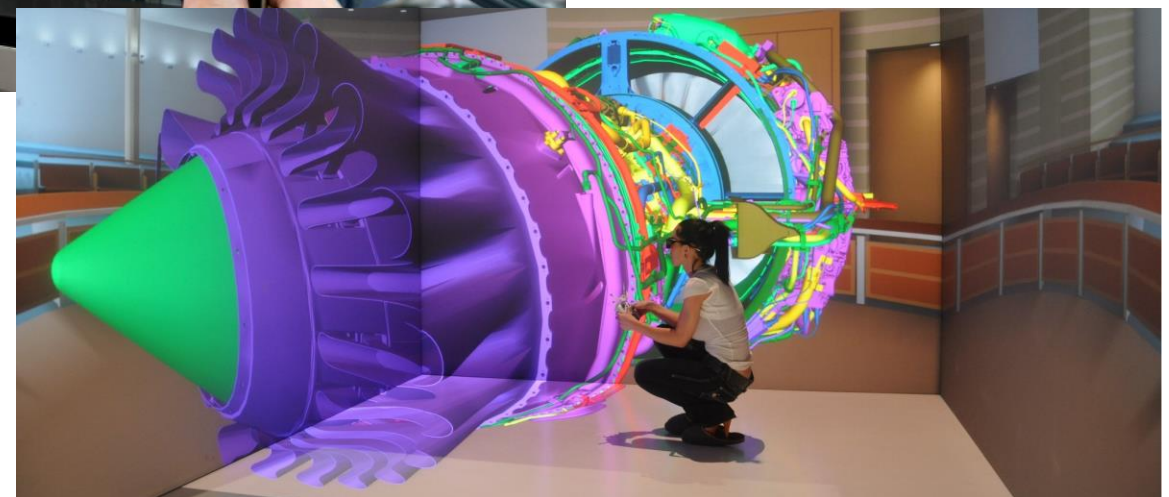
6D

SUSTAINABILITY

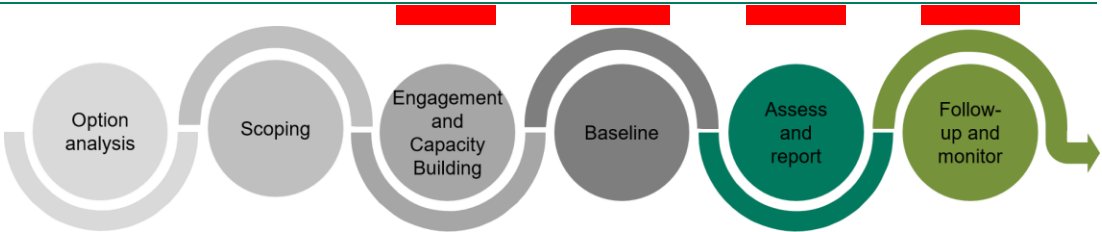
- Conceptual energy analysis via DProfiler
- Detailed energy analysis via EcoTech
- Sustainable element tracking
- LEED tracking

7D

- FACILITY MANAGEMENT APPLICATIONS**
- Life Cycle BIM Strategies
 - BIM As-Built
 - BIM embedded O&M manuals
 - COBie data population and extraction
 - BIM Maintenance Plans and Technical Support
 - BIM file hosting on Lend Lease's Digital Exchange System



Field Activities: progress and quality control



New Location

Location ID

SB-03

Location type

Soil boring

Latitude

39.56271470

Longitude

-78.83329210

Was the survey of this location finalised?

☐ Yes. The location was actually surveyed with a higher accuracy equipment.

☐ Not yet. The location was surveyed in the APP through the mobile device

☐ No. The coordinates came from GIS or dropped on the map

Drop pin on the map

Save

Cancel

By activity

By Location

View/edit locations

New

Edit

Upload list

Location
A-001
A-002
A-003
B-30
B-31
B-32
B-33
B-34
B-38
B-4
B-42
B-44

February 2018

Today

month

day

<

>

Sun	Mon	Tue	Wed	Thu	Fri	Sat
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1
4	5	6	7	8	9	10

Monitoring well

Monitoring well

Monitoring well

Save & Send updates to EQUIS

Reply

Reply All

Forward

IM

Mon 05/03/2018 10:04

erm_aca@equisonline.com

EDD File 201803051421PlanActivity.GADGET-SPRINGFIELD.EDGE

To

Simon Gibbons

Your EDD file '201803051421PlanActivity.GADGET-SPRINGFIELD.EDGE.zip' has been a

Planned purge method:

☒ Low Flow ☐ Fixed Volume ☐ No Purge

Field parameters and stabilization criteria

Are there site specific stabilization criteria?

☐ Yes ☒ No

Number of consecutive readings:

3

pH

+/- 0.1

Temperature

+/- 3%

☒ °C ☐ °F

Specific Conductivity

+/- 3%

☒ µS/cm ☐ mS/cm

Dissolved oxygen

+/- 10%

☒ mg/L ☐ %

Turbidity

+/- 10%

ORP

+/- 10mV

Analytical parameters

Select

Please enter information where applicable:

VOC

Full VOC Suite

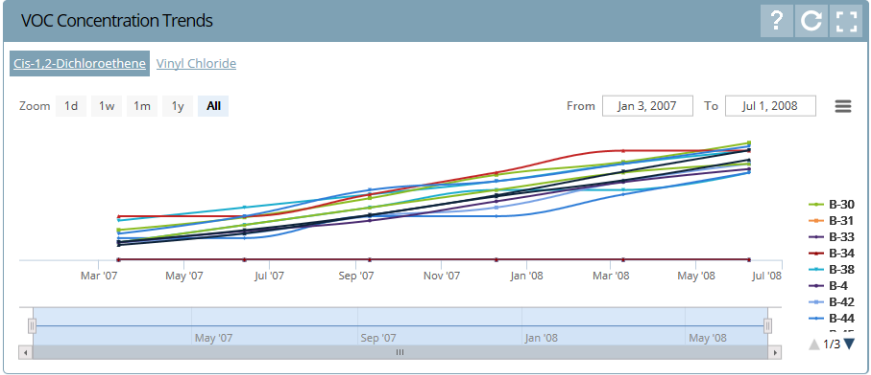
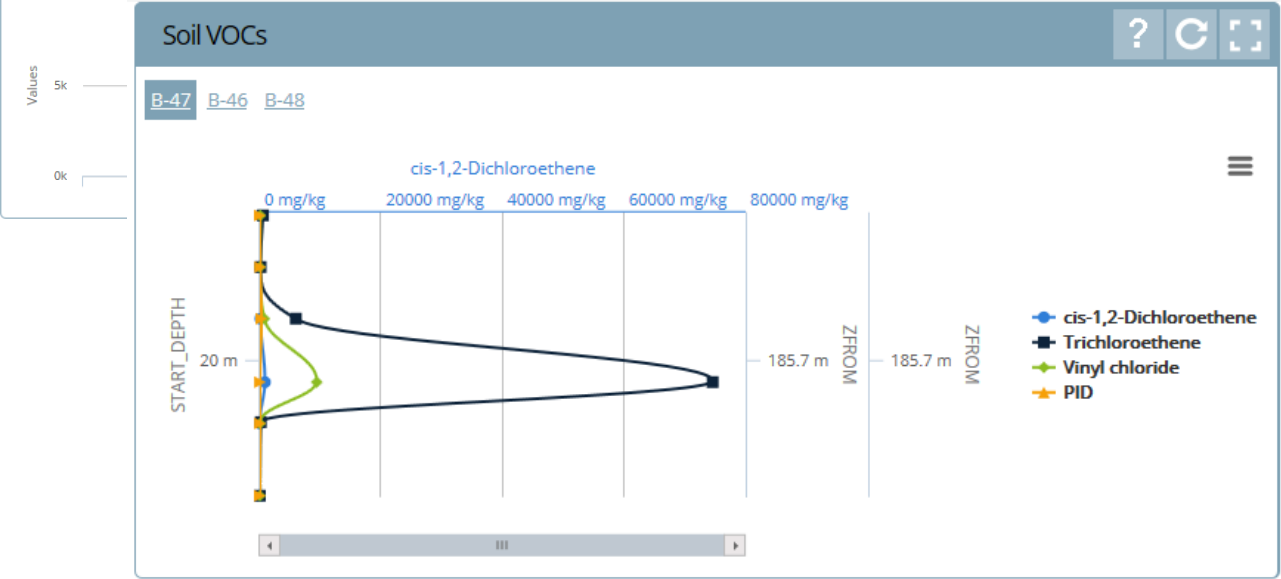
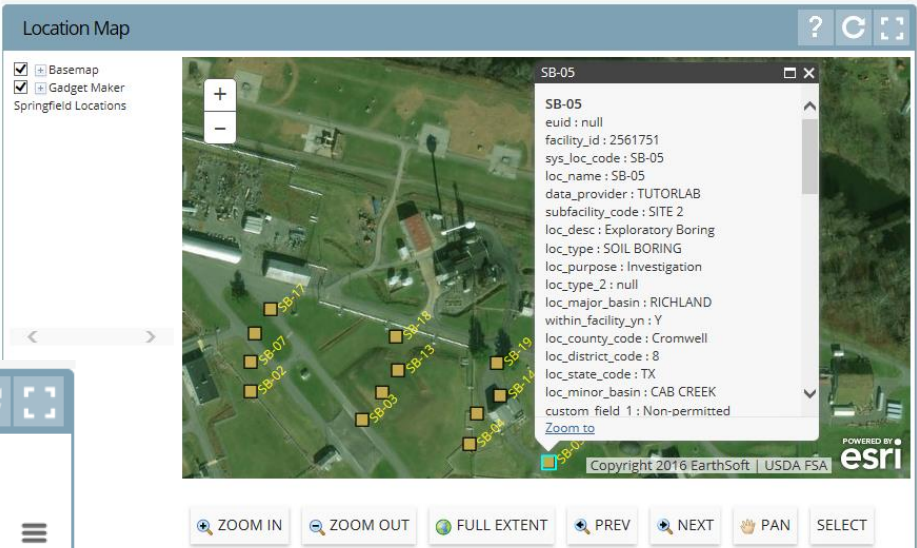
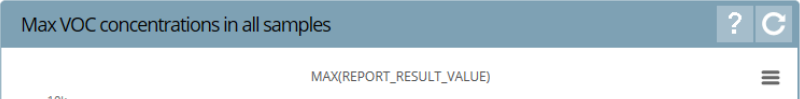
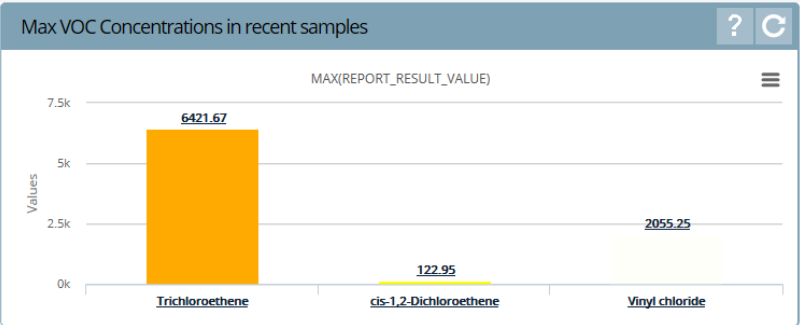
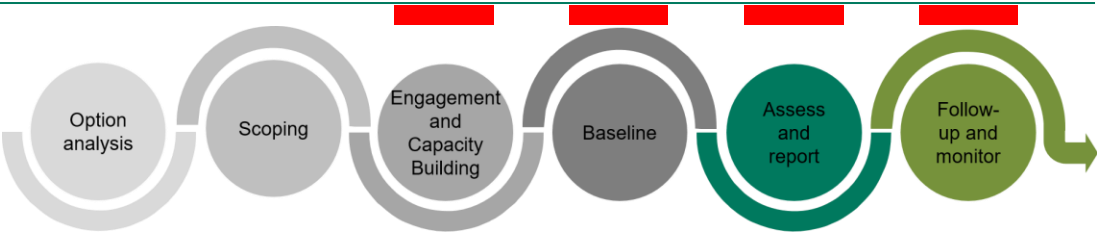
TPH

EPA Risk based Split

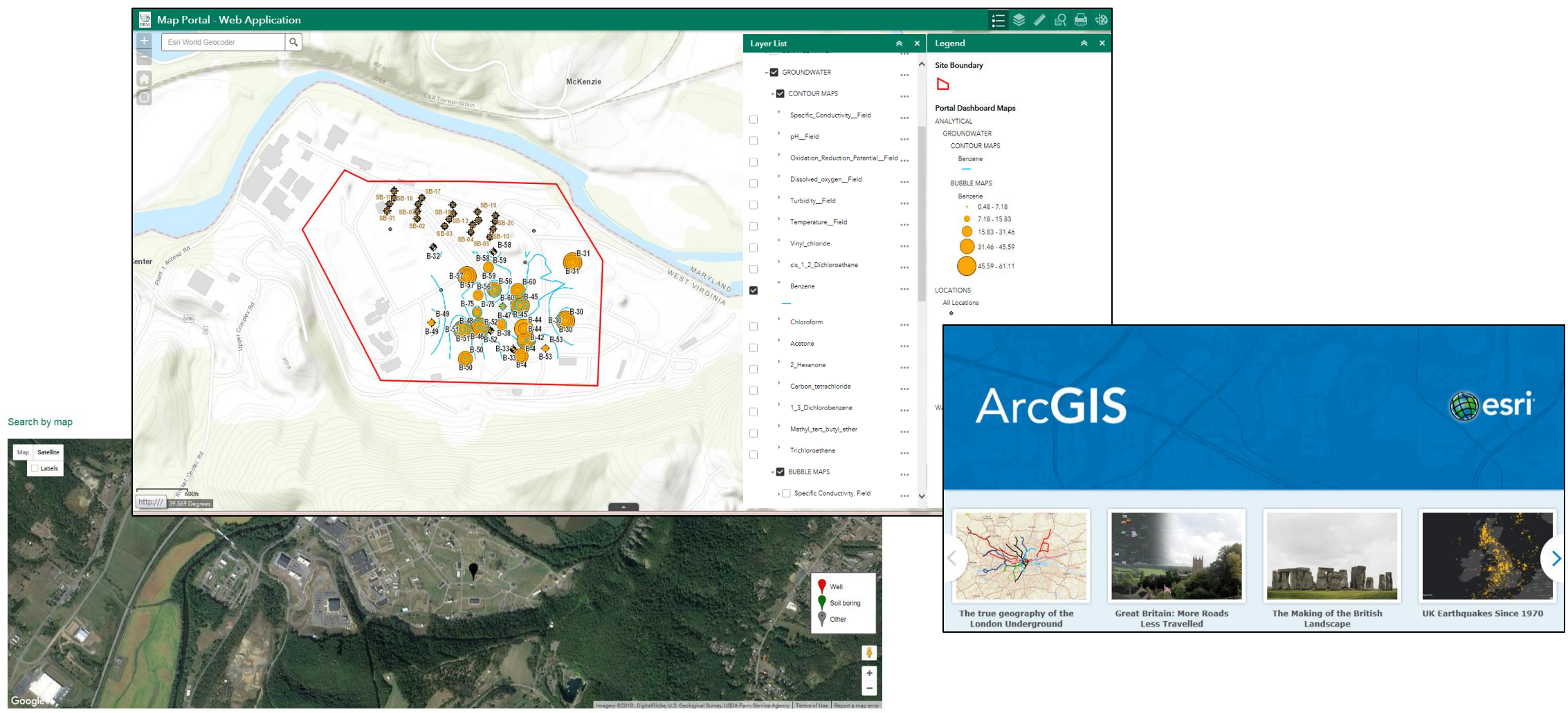
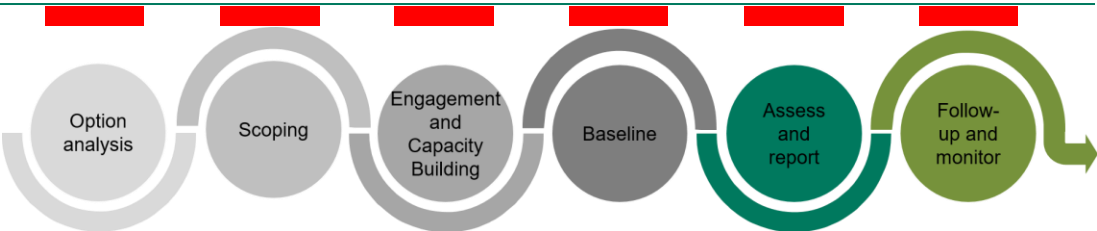
Total Metals

Pb, Hg, Cu, Zn, Fe, Mn,

Dashboards – Soil and Groundwater Data



Dashboards – Site Photographs and Maps

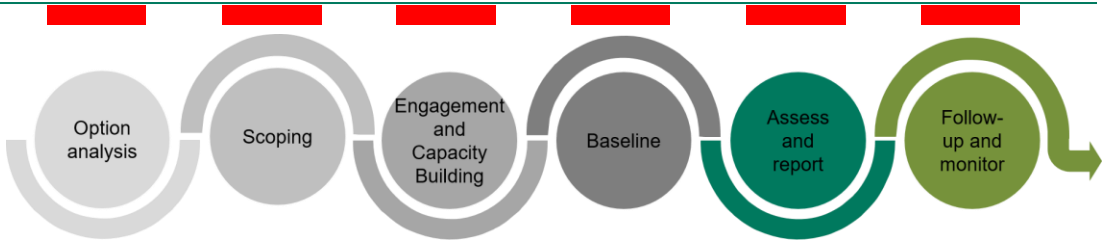


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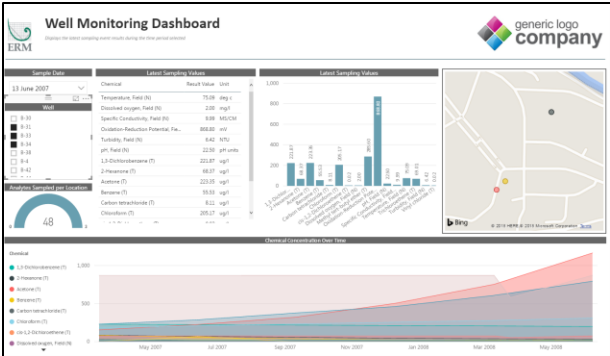
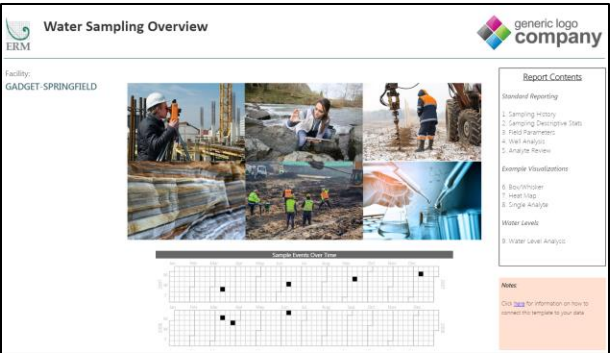
Reporting Dashboards

Albert Einstein

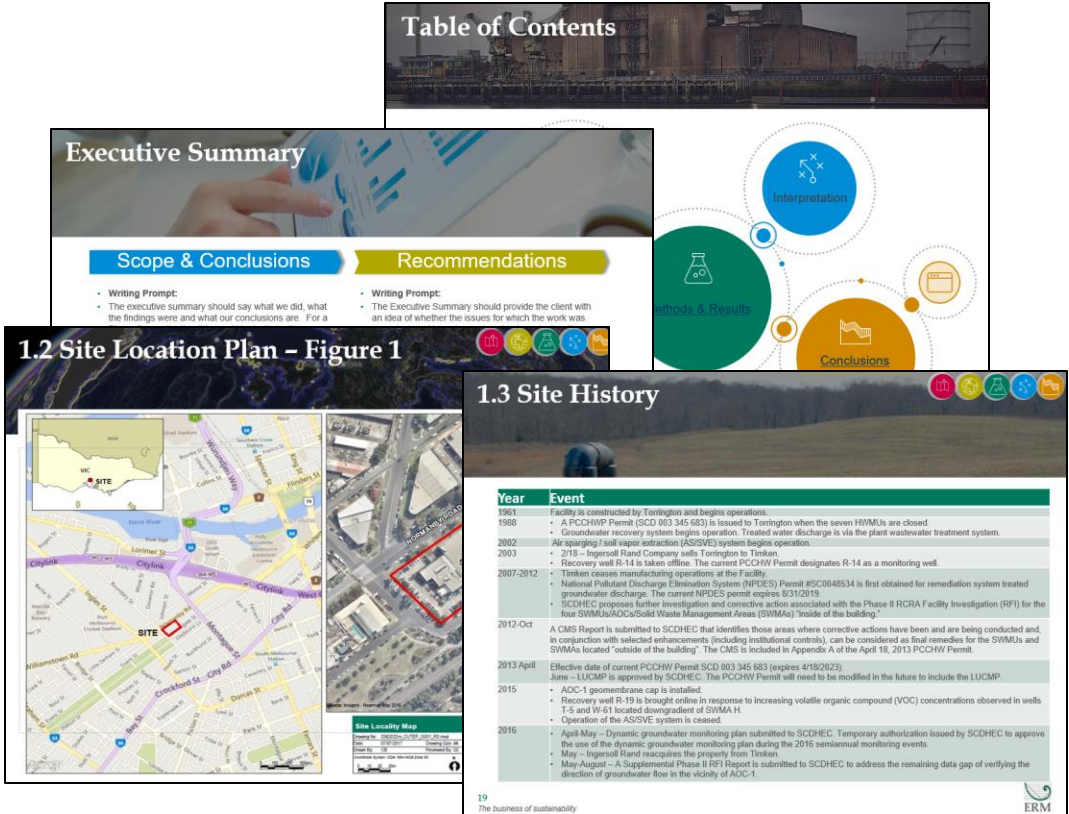
Microsoft Suite



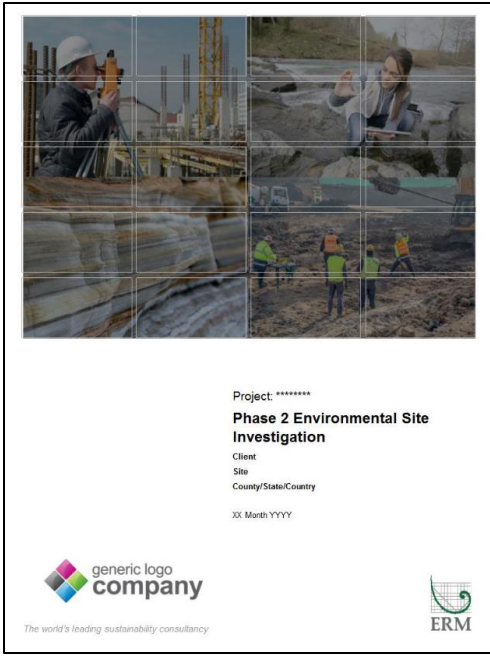
Microsoft Power Business Intelligence (BI)



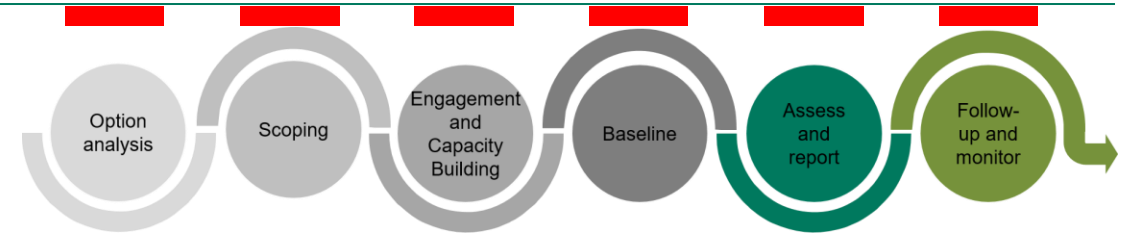
Microsoft PowerPoint



Microsoft Word

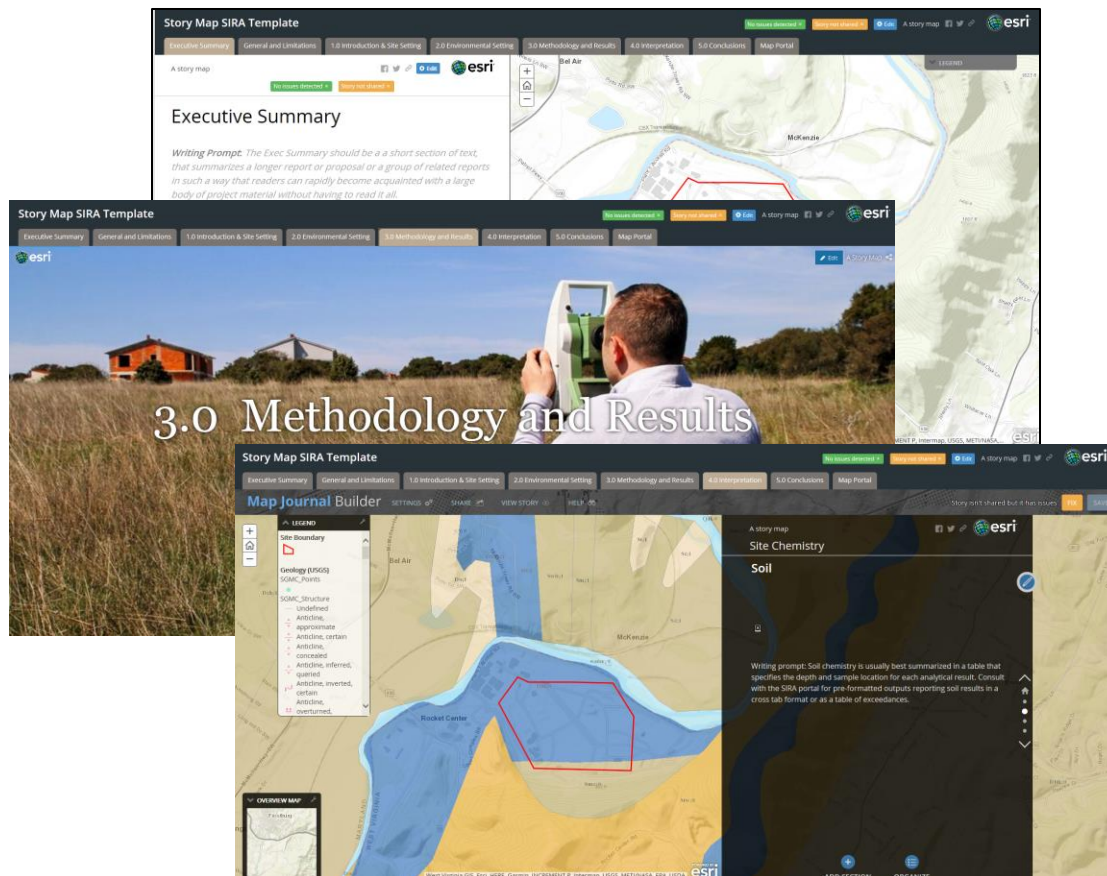


Story Maps and web-based

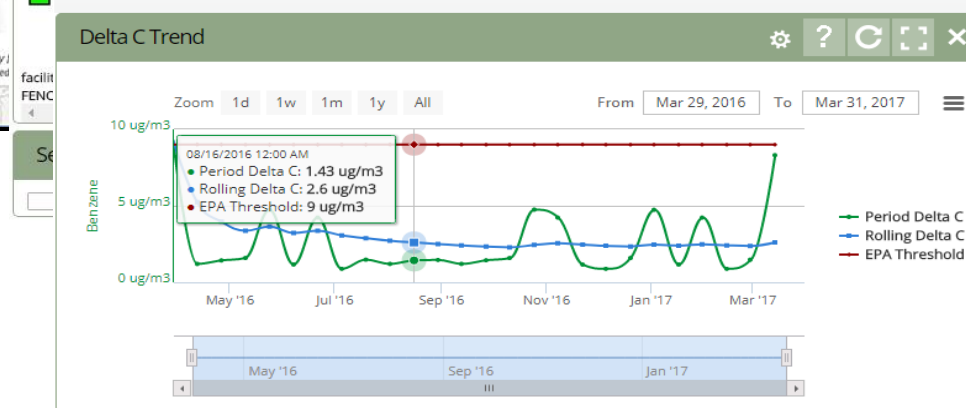
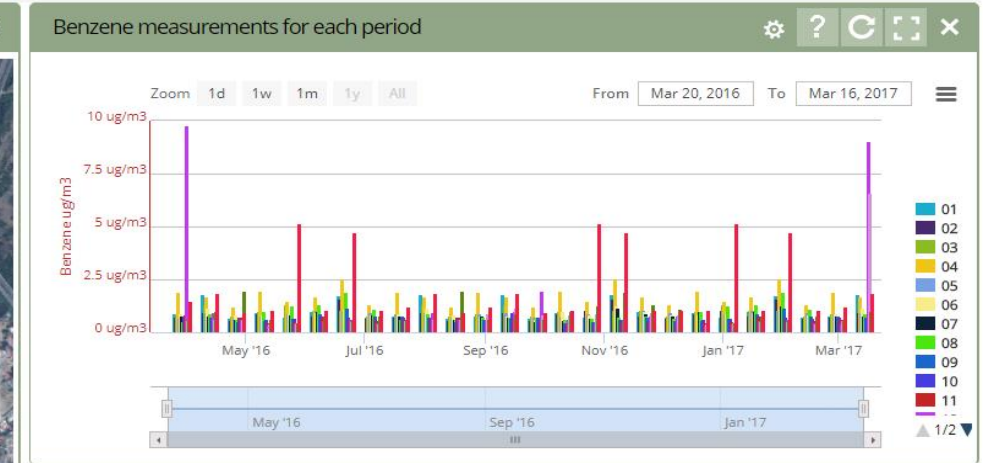
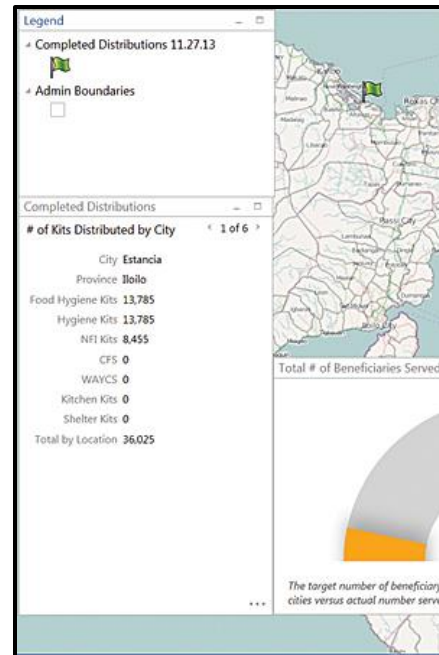
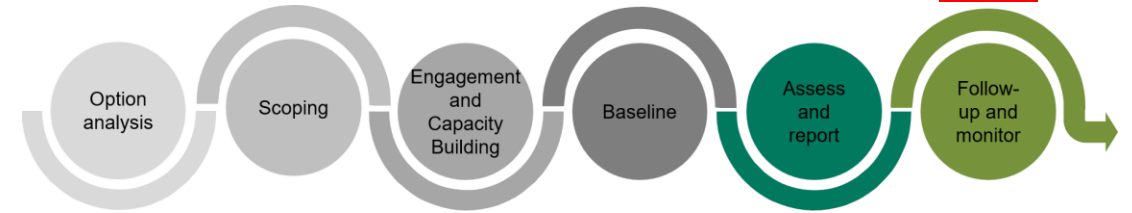


ESRI Story Maps

Web GIS / Digital Data Platform



Follow-up and Monitoring

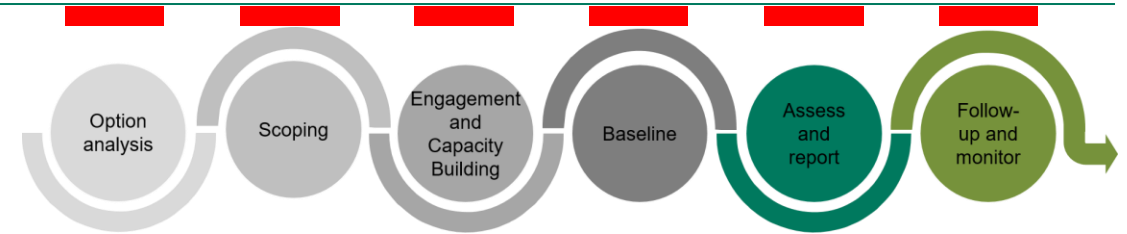


Period Delta C

ERM-Q94 Delta C All Periods DemoFenceline
 Filter:
 Go to page: 1 Rows per page: 10 Showing 1-10 of 26

Period	Minimum	Maximum	Period Delta C
20160329	0.55	9.81	9.26
20160412	0.66	1.86	1.20
20160426	0.54	1.97	1.43
20160510	0.38	1.97	1.59
20160524	0.43	5.17	4.74
20160607	0.52	1.68	1.16
20160621	0.52	4.75	4.23
20160705	0.44	1.32	0.88

The Sustainable Development Goals



Digital approaches to ESIA could help overcome some of the common barriers to achievement of SDGs, such as:

- Complexity including regulatory barriers.
- Lack of buy-in or acceptance.
- Insufficient resources and capital.
- Lack of engagement.
- Unclear leadership or cross sector collaboration.
- Demand.
- Insufficient monitoring or ability to measure impact.

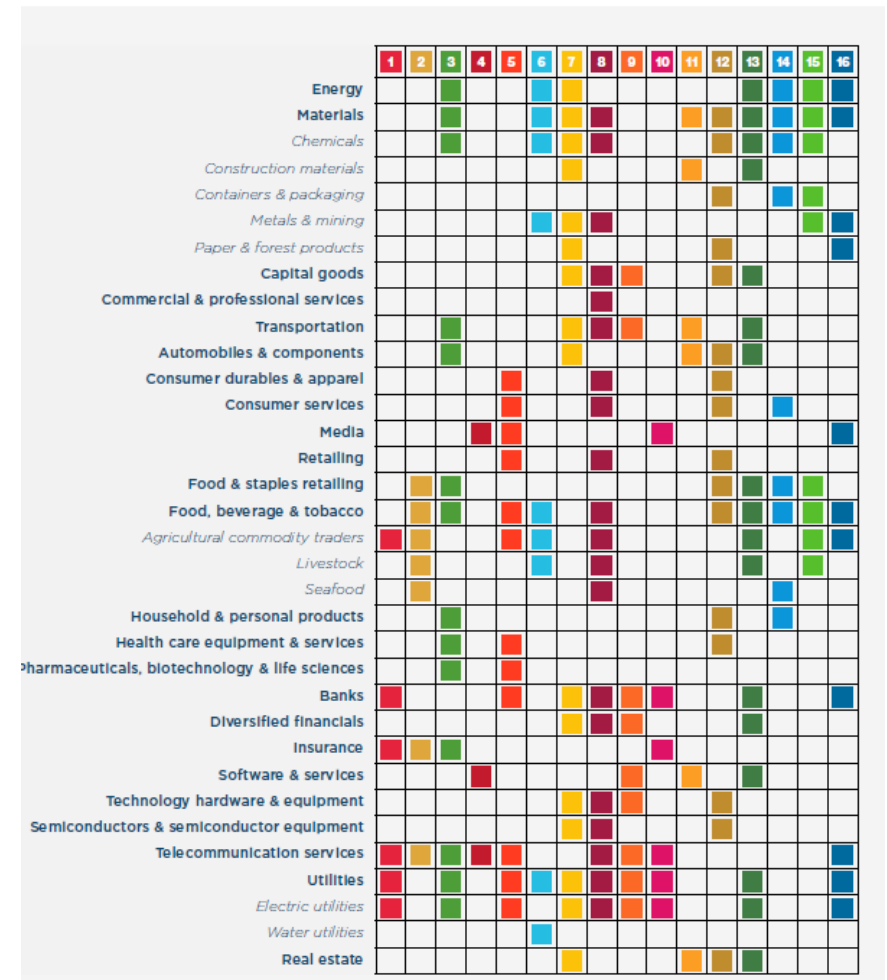
Economic impact



Social impact:



Environmental impact:





Thank you

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