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Data Quality

Data Validity and Usability in the RI/FS Process

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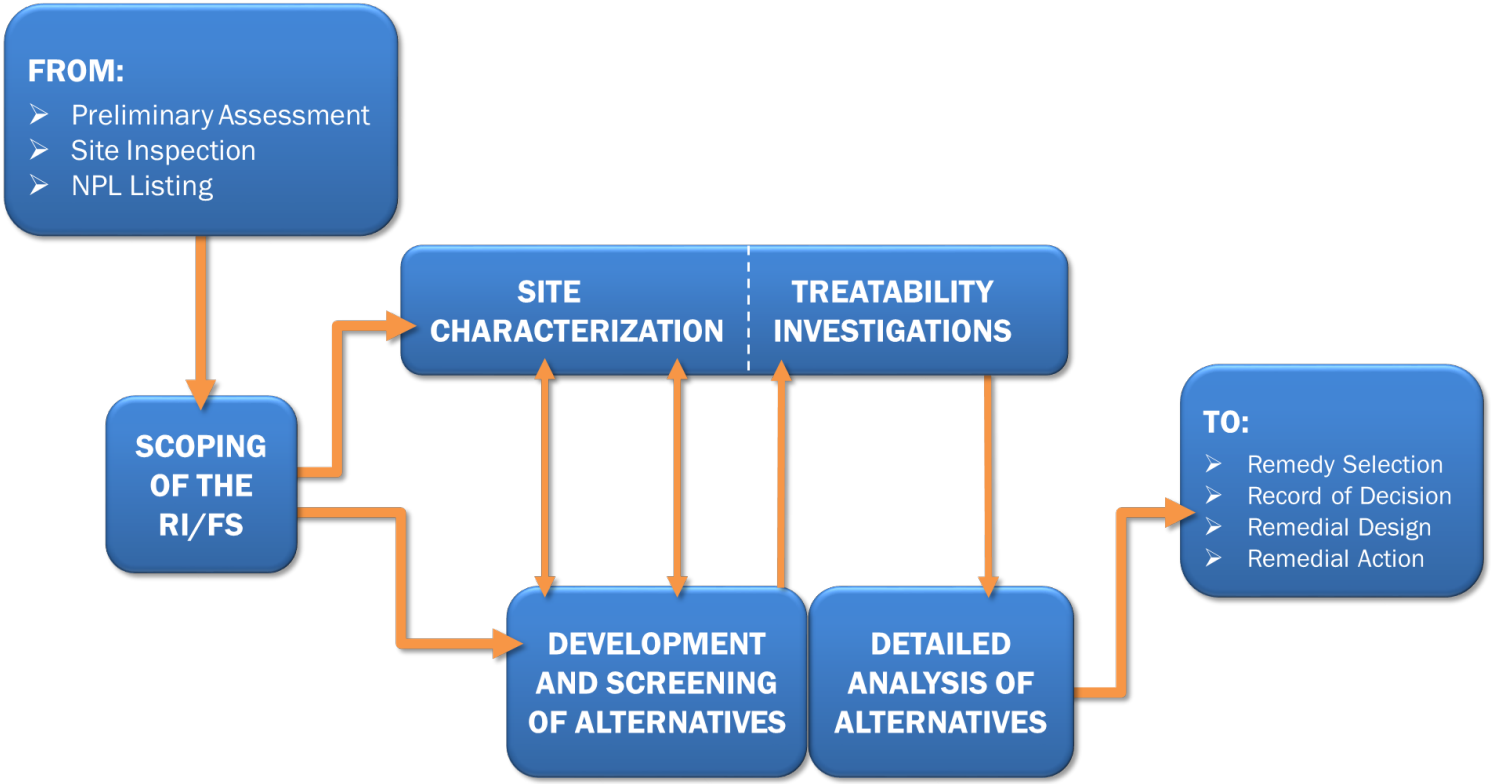
RI/FS Process

Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (EPA 1988).



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Data Quality Process for RI/FS

- Plan the investigation
- Collect samples
- Analyze samples
- Verify and validate data
- Evaluate and use the data

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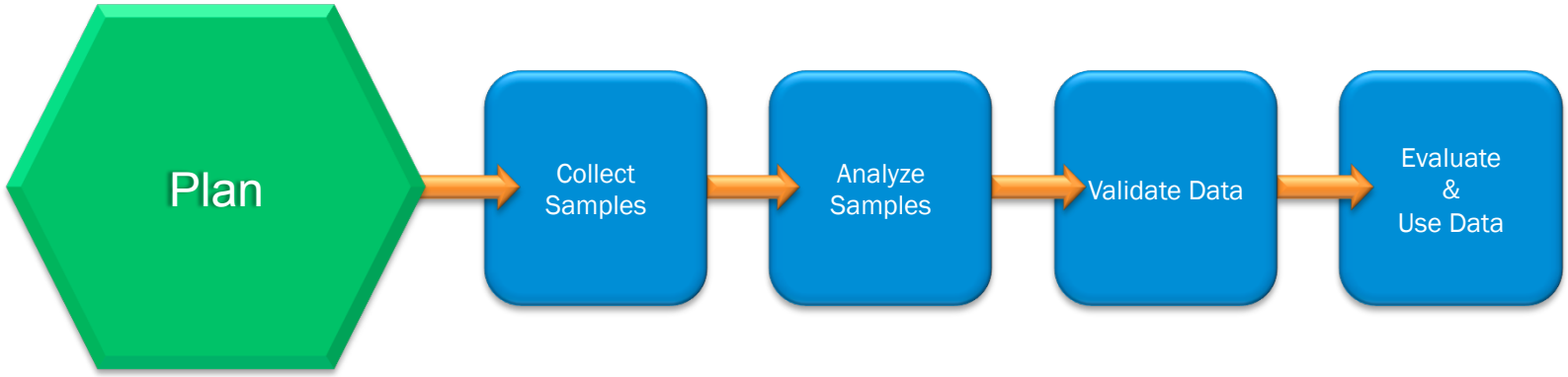
Step 1: Plan the Investigation

Gather these resources:

- Site map and history
- Guidance documents
- Screening/action levels
- SOPs (lab and field)
- Data quality professionals



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Involve Data Quality Professionals

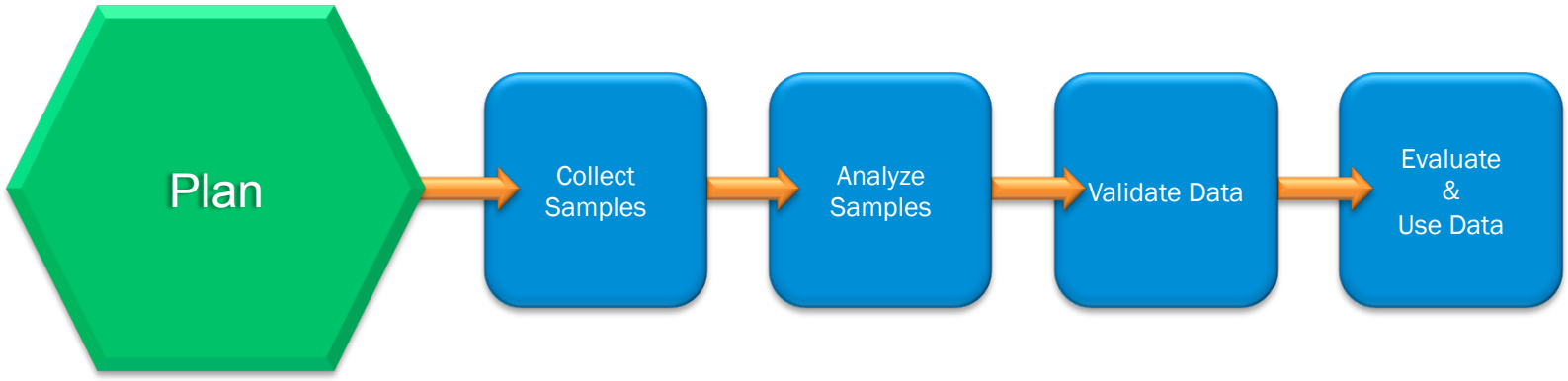
These include:

- Laboratory project managers
- Laboratory chemists
- Data validators
- Database managers
- Statisticians
- AutoCAD users
- GIS users
- Risk assessors
- Regulatory compliance specialists

Step 1: Plan the Investigation

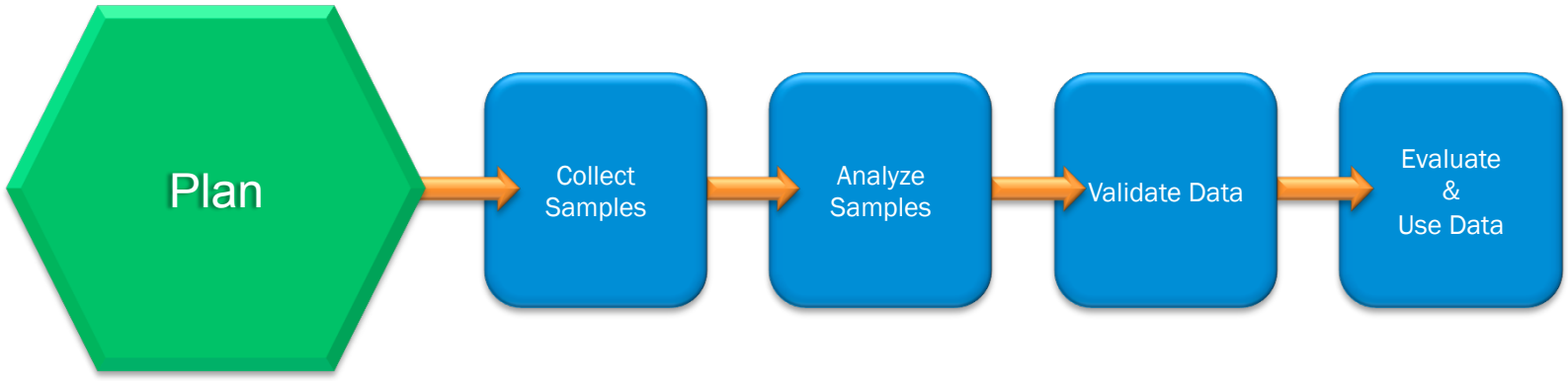
Develop these plans:

- Budget
- Project timeline
- Data quality objectives
- QAPP (Define the COPCs)
- SAP (the “work plan”)
- Conceptual Site Model



Step 1: Plan the Investigation

- Define the purpose of the RI/FS
- Understand the problem and prioritize the problem
- Set clear and achievable goals (DQOs)
- Follow the regulatory requirements and/or guidance



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Step 1: Plan the Investigation

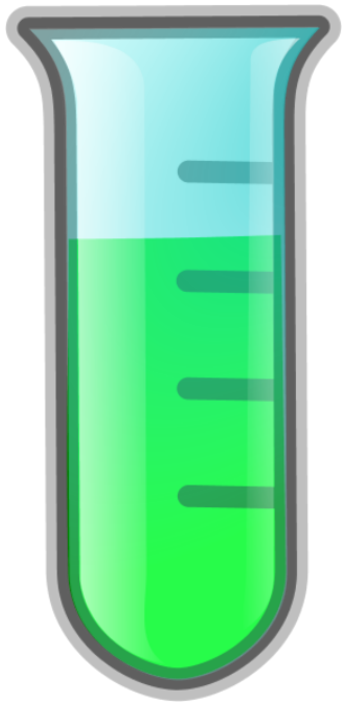
Data quality professionals help by:

- Reviewing the budget and project timeline
- Reviewing the DQOs in the SAP/QAPP
- Selecting site-specific screening/cleanup levels
- Selecting a laboratory and analytical methods
- Evaluating field QC frequency (duplicates, rinse blanks)
- Determining number of samples needed
- Communicating with the database manager/user(s)

Step 1: Plan the Investigation

Criteria for selecting a laboratory:

- Capacity and turn-around time
- Technical ability (meets the necessary RLs/MDLs)
- Good communication
- Applicable certifications
- Ability to produce the required project deliverables
- Experience on the project site



Step 1: Plan the Investigation

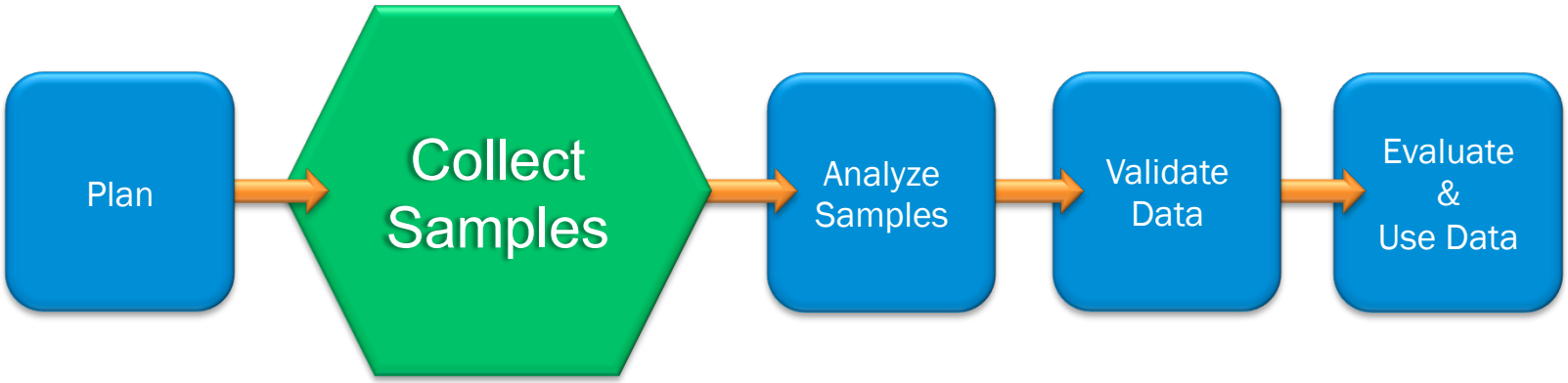
If data validation is required:

- Select the level of validation
- Determine which guidance applies for validation
- Select a desired format for the data validation report
- Determine the EDD format for qualified data

Step 2: Collect Samples

Use these resources:

- Health and Safety Plan
- Site map and History
- SAP and/or QAPP
- Field SOPs
- Field documentation
- Chains of custody



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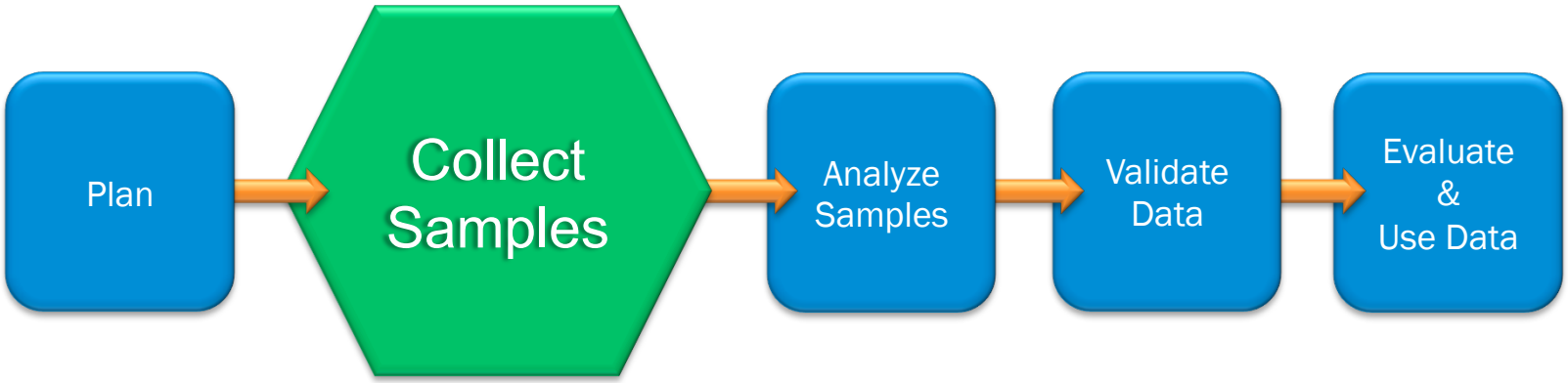
Step 2: Collect Samples

- Sample containers, preservation, and holding time requirements
- GPS or survey data
- Sampling equipment and tools
- Cooler packing
- Shipping vs. courier services



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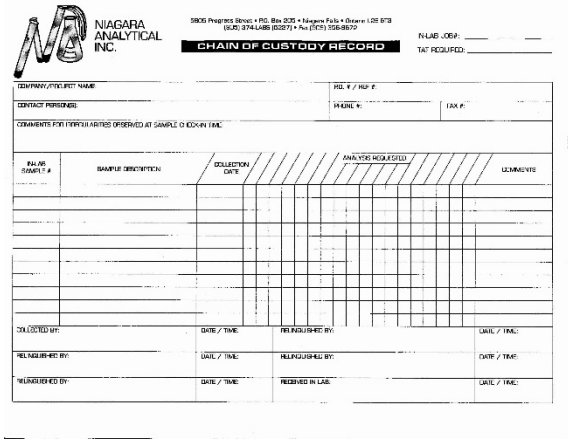
Step 2: Collect Samples

Data quality professionals help by:

- **Reviewing COCs to**
  - Spot documentation problems and potential analytical problems
  - Anticipate laboratory batching to make validation more cost effective
- **Providing technical support for problems encountered in the field that may affect data quality**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CHAIN OF CUSTODY RECORD

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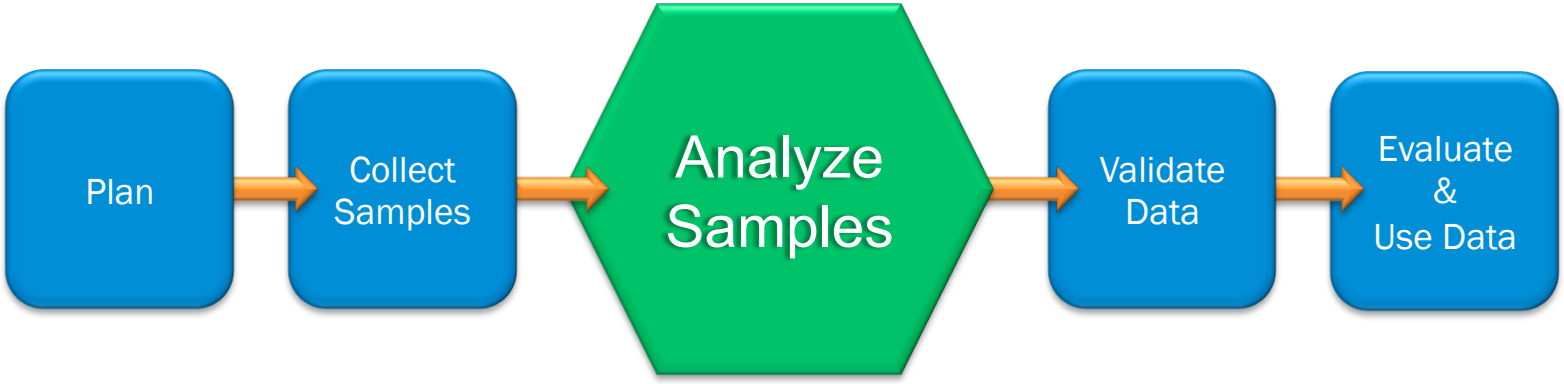
Step 3: Analyze Samples

According to:

- Chains of custody
- Published methods or laboratory SOPs

- SAP/QAPP for DQOs
- Laboratory Quality Management Plan
- MDLs/RLs and screening or cleanup levels



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Step 3: Analyze Samples

- Build a rapport with the laboratory to facilitate effective communication.
- Ask the lab to relay problems or issues in a timely manner.
- The project team must be able to advise the laboratory on how to proceed.
- Get the sample to the lab as quickly as possible!
- Request sample login confirmation and review it in a timely manner.
- Don’t ask the laboratory to meet low RLs for non-priority analytes.
- Don’t be a victim of “units confusion.”

Step 3: Analyze Samples

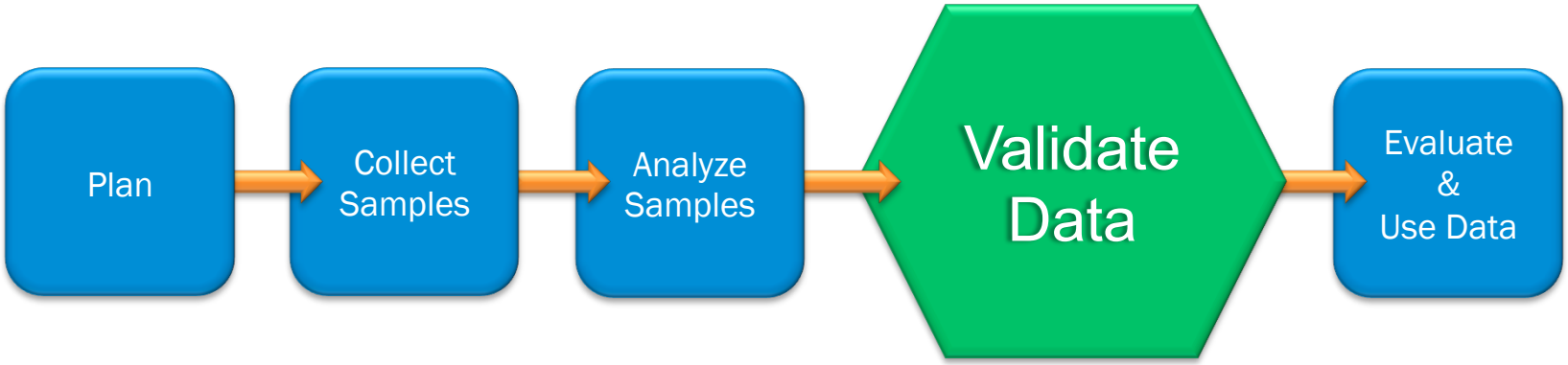
Data quality professionals help by:

- Reviewing an early data package to
  - Determine if the laboratory deliverables are complete and as expected
  - Provide feedback in regard to analytical issues or irregularities
  - Compare results to the DQOs from the SAP/QAPP
- Providing technical support for analytical issues that may affect data quality

Step 4: Verify/Validate Data

Using these tools:

- SAP/QAPP for DQOs
- Field chains of custody
- MDLs/RLs and screening or cleanup levels
- Published methods or laboratory SOPs
- Data validation guidance
- Lab reports & EDDs



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Step 4: Verify/Validate Data

Data quality professionals help by:

- Completing verification and/or validation
- Communicating data quality issues
- Providing technical support for analytical issues that may affect data quality
- Working with the laboratory to minimize the affects of extreme data quality issues and help salvage as much data as possible when this situation occurs

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Step 4: Verify/Validate Data

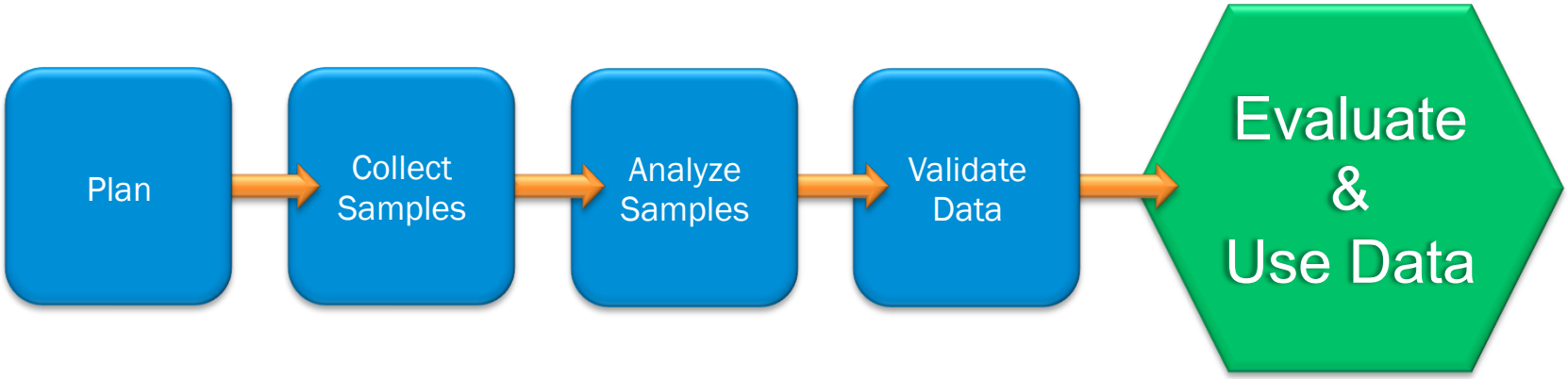
Have your data quality professionals help by:

- Determining data usability
  - Selecting the most appropriate result from multiple analyses (dilutions, re-extractions, if the same analyte is reported from multiple methods)
  - Determine high or low bias for qualified data
  - Explain rejected data
- Providing a complete report detailing the results of validation with associated qualified laboratory results

Step 5: Evaluate & Use Data

Using these tools:

- Historical Project Data
- SAP/QAPP for DQOs
- Field data and logbooks
- Data validation reports
- MDLs/RLs and screening or cleanup levels
- Guidance documents
- Site maps



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Step 5: Evaluate & Use Data

- Throw out rejected data! Do not use any rejected results for decision making.
- Use qualitative information such as bias and comparability in your evaluation.
- Include data validation qualifiers in data tables, especially if “U” flags were added during DV.
- Re-calculate totals and TEQs based on qualified data.
- Make sure units are correct and check for reasonableness (e.g. Any results >1,000,000 ppm?)

Key Takeaways

- Data quality issues can cause expanded investigations, budget overruns, incomplete risk evaluations, and many other problems at complex sites.
- Planning and communication are essential.
- Review each stage of the RI/FS project from planning to execution with the help of data quality professionals to maximize success.
- Choose a good lab that communicates issues in a timely manner.
- Prioritize – tackle the big problems first, be practical and efficient by setting realistic DQOs.

And, Finally, Use the Data

Congratulations!

Engineers, geologists, responsible parties, regulators, etc. have confidence that the results can be used for decision making!

Questions?