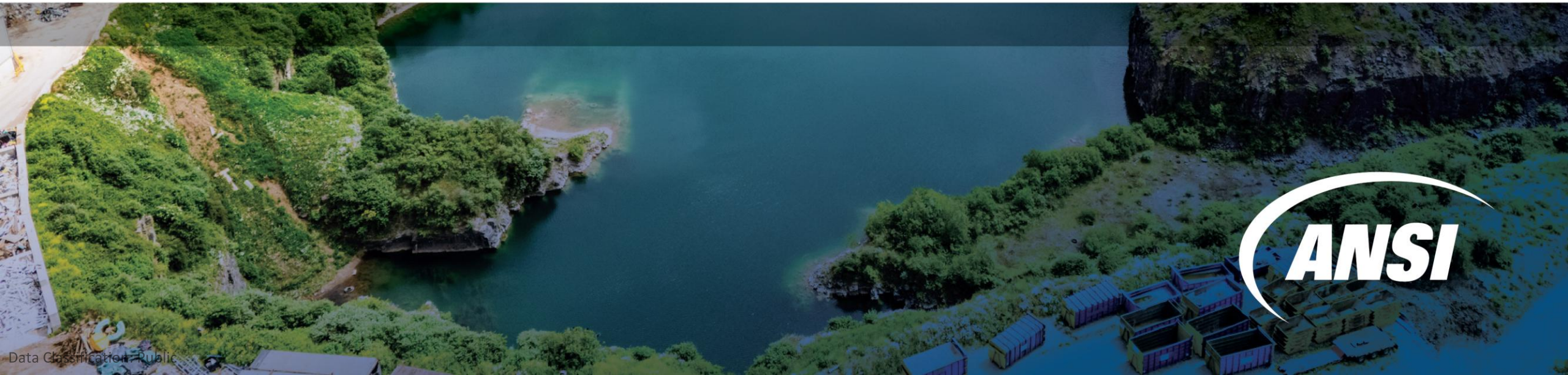




Information presented on these slides were compiled by ANSI staff based on registrant feedback and are provided to support workshop discussions only.

They are not positions or recommendations from session moderators or formal and final statements.



Midstream Deep Dive

Moderated by:
Mallory Clites

U.S. Department of Energy





Midstream Deep-Dive Tasking

- **Examine** *midstream activities in critical minerals supply chains, including processing, refining, and the transformation of raw materials into higher-purity forms suitable for industrial use.*
- **Explore** *current methods, systems, and requirements, including how materials are prepared for manufacturing and how midstream processes connect upstream inputs with downstream applications.*
- **Consider** *implementation challenges, lessons learned, and the role of standards in supporting material specifications, quality consistency, and integration across supply chain stages.*

1 Desired-End State | Midstream

- *What outcomes are stakeholders seeking to achieve in midstream activities, including processing, refining, and material transformation?*
- *How do midstream outputs need to align with both upstream inputs and downstream manufacturing requirements?*
- *What capabilities are currently in place, and what additional capabilities are needed to support consistent implementation?*
- *What does U.S. leadership in the global market look like, and what are the indicators of success?*
 - *Leadership in standards? Are we there yet?*
 - *Leadership in the market? Are we there yet?*
- *What role do standards play in the desired end-state?*

1 **DRAFT** Desired-End State | Midstream

Midstream processing produces consistently characterized, qualified, and globally tradable materials that connect upstream production with downstream manufacturing needs.

Key Characteristics:

- Consistent material specifications
- Verified product quality
- Standardized testing methods
- Global market acceptance
- Traceable processing pathways

2

Compliance Expectations | Midstream

- *How do regulatory frameworks, trade requirements, and conformity assessment approaches (e.g., testing, inspection, certification) affect midstream processing and refining activities?*
- *Where do differences across jurisdictions or systems create challenges for implementation or for meeting downstream specifications?*
- *Where none exist, should they? Why type?*

Feedback Prior to Workshop:

1. Product quality requirements
2. Refining certifications
3. Trade specifications
4. Import/export requirements

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here

3

Implementation Experience & Barriers | Midstream

- *What challenges have stakeholders encountered in processing, refining, or material conversion?*
- *What factors (e.g., technical, operational, or commercial) affect the ability to consistently produce materials that meet downstream requirements?*

Feedback Prior to Workshop:

1. Lack of product specifications
2. Undefined battery-grade standards
3. Qualification bottlenecks
4. Inconsistent assay methodologies

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here

4

Standards Utilized & Gaps | Midstream

- *What standards or frameworks currently support midstream activities, including material specifications and quality requirements?*
 - *Organization level feedback is a great start!*
- *Where are gaps, overlaps, or inconsistencies observed, particularly in how materials are defined, measured, or verified?*

Standards Utilized:

1. Material specs remain contract-based
2. Discussion captured here
3. Discussion captured here

Gaps :

1. Few processing standards
2. Limited impurity thresholds
3. Inconsistent terminology
4. Discussion captured here
5. Discussion captured here

5

Coordination, Alignment & Interoperability | Midstream

- *Where is alignment needed between upstream inputs and downstream product requirements to support continuity across the supply chain?*
- *What challenges arise in ensuring consistent specifications, testing methods, and data exchange **across** stages?*

Feedback Prior to Workshop:

1. Upstream-to-downstream data continuity
2. Harmonized quality requirements
3. Consistent assay methods
4. Global specification alignment

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here

6 Data & Pre-standardization Needs | Midstream

- *What data, definitions, or technical inputs are needed to support midstream activities and their connection to upstream and downstream stages?*
- *Are there areas where additional work is needed before standards can be developed or more widely implemented?*

Feedback Prior to Workshop:

1. Reference materials
2. Product-grade specifications
3. Benchmark feedstocks
4. Processing performance metrics
5. Facility-level datasets

Workshop Whiteboard:

1. Discussion captured here
2. Discussion captured here