

PHOENIX RISING: THE APPLICATION OF ISR FOR HIGH GRADE URANIUM MINING IN THE ATHABASCA BASIN

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Powering
**PEOPLE, PARTNERSHIPS
AND PASSION.**

 **Denison Mines**
Uranium Development & Exploration
The Athabasca Basin, Northern Saskatchewan


ALTA
2023 27
Uranium Mining Summit

Cautionary Statements & References



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Forward looking statements are based on the opinions and estimates of management as of the date such statements are made, and they are subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of Denison to be materially different from those expressed or implied by such forward-looking statements. Denison faces certain risks, including the proposed use of mining methods which are novel and untested in the Athabasca basin, the inability to permit or develop its projects as currently planned, the inability to secure sufficient financing to pursue its business objectives, the unpredictability of market prices, events that could materially increase costs, changes in the regulatory environment governing the project lands, and unanticipated claims against title and rights to the project. Denison believes that the expectations reflected in this forward-looking information are reasonable but there can be no assurance that such statements will prove to be accurate and may differ materially from those anticipated in this forward looking information. For a discussion in respect of risks and other factors that could influence forward-looking events, please refer to the "Risk Factors" in the Annual Information Form dated March 27, 2023 available under its profile at www.sedar.com and Annual Report on Form 40-F available at www.sec.gov/edgar.shtml. These factors are not, and should not be construed as being, exhaustive.

Readers should not place undue reliance on forward-looking statements. The forward-looking information contained in this presentation is expressly qualified by this cautionary statement. Any forward-looking information and the assumptions made with respect thereto speaks only to the effective date of this presentation. Denison does not undertake any obligation to publicly update or revise any forward-looking information after such date to conform such information to actual results or to changes in its expectations except as otherwise required by applicable legislation.

Cautionary Note to United States Investors Concerning Estimates of Mineral Resources and Mineral Reserves: This presentation may use terms such as "measured", "indicated" and/or "inferred" mineral resources and "proven" or "probable" mineral reserves, which are terms defined with reference to the guidelines set out in the Canadian Institute of Mining, Metallurgy and Petroleum ("CIM") CIM Definition Standards on Mineral Resources and Mineral Reserves ("CIM Standards"). The Company's descriptions of its projects may not be comparable to similar information made public by U.S. companies subject to the reporting and disclosure requirements under the United States federal securities laws and the rules and regulations thereunder.

Qualified Persons

The disclosure of a scientific or technical nature within this presentation, including the disclosure of mineral resources, mineral reserves, as well as the results of the Wheeler PFS and Waterbury PEA, was reviewed and approved by Chad Sorba, P.Geo, Denison's Director Technical Services, and Andy Yackulic, P.Geo, Denison's Director Exploration, each of whom is a Qualified Person in accordance with the requirements of NI 43-101.

Technical Reports

- For further details regarding the **Wheeler River project**, please refer to the Company's press release dated September 24, 2018 and the technical report titled *"Prefeasibility Study for the Wheeler River Uranium Project, Saskatchewan, Canada"* with an effective date of September 24, 2018 ("Wheeler PFS").
- For further details regarding the **Waterbury Lake project**, please refer to the Company's press release dated November 17, 2020 and the technical report titled *"Preliminary Economic Assessment for the Tthe Heldeth T    (J Zone) Deposit, Waterbury Lake Property, Northern Saskatchewan, Canada"* with an effective date of October 30, 2020 ("Waterbury PEA"). **The PEA is a preliminary analysis of the potential viability of the Project's mineral resources, and should not be considered the same as a Pre-Feasibility or Feasibility Study, as various factors are preliminary in nature.** The PEA includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized. **Mineral resources are not mineral reserves and do not have demonstrated economic viability. Scheduled tonnes and grade do not represent an estimate of mineral reserves.**

For a description of the data verification, assay procedures and the quality assurance program and quality control measures applied by Denison, please see Denison's Annual Information Form dated March 27, 2023. A copy of the foregoing is available on Denison's website and under its profile on SEDAR at www.sedar.com and on EDGAR at www.sec.gov/edgar.shtml.

- **Company Background**
- **PFS summary**
 - **Selection of ISR Mining Method**
- **Deposit Setting**
- **4 Year De-risking Plan**
 - **2019 through 2022**
 - **Focus on Containment, Permeability and Leaching**
 - **Optimizations and Trade-Off Studies**
 - **Freeze Containment**
 - **UBS Head Grade**

Diversified Athabasca Basin asset base with superior development leverage

95%⁽¹⁾

**effective interest in
Flagship
Wheeler River project**

PFS stage development project⁽²⁾

Largest undeveloped uranium
project in the infrastructure rich
eastern Athabasca Basin

Feasibility Study in progress⁽³⁾

Draft Environmental Impact
Statement ("EIS") submitted⁽⁷⁾

22.5%

**interest in
Strategic McClean Lake
Uranium Mill**

Strategic regional asset

+11% of global uranium
production

Excess licensed annual capacity

Licensed for expansion of tailings
management facility ("TMF") ⁽⁴⁾

67.41%

**interest in
Emerging
Waterbury Lake project**

PEA stage development project⁽⁵⁾

The Heldeth Tûé ("THT") deposit
(formerly J Zone) highlights
potential for future development
project pipeline

**Participating interests in key development-
stage assets operated by uranium "majors"**

Includes 22.5% in McClean Lake (Orano), 25.17% in Midwest (Orano), and an effective 15% in Millennium (Cameco) through 50% ownership of JCU⁽⁶⁾

~300,000

**hectares of
exploration ground**

PHOTO:

Aerial view of Denison's
22.5% owned McClean
Lake mill facility

NOTES:

(1) Denison increased its effective interest in Wheeler River as part of the acquisition of 50% of JCU (Canada) Exploration Company, Limited. See Denison's news release dated August. 3, 2021.

(2) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018.

(3) See news release dated September 22, 2021.

(4) See news release dated January 19, 2022.

(5) Refer to the Waterbury Lake Technical Report titled "Preliminary Economic Assessment for the Tthe Heldeth Tûé (J Zone) Deposit, Waterbury Lake Property, Northern Saskatchewan, Canada" dated October 30, 2020.

(6) See news release dated August. 3, 2021.

(7) See news release dated October 26, 2022.

Large land position in the infrastructure-rich eastern portion of the Athabasca Basin⁽¹⁾⁽²⁾



- 100% Denison
- Denison operated JV
- Orano operated JV
- Cameco operated JV
- Denison earn-in
- Uranium mines and deposits
- Uranium mill
- Roads
- Powerlines



NOTES:

(1) Denison direct land position shown as of December 31, 2022.

(2) Excludes interests held only through 50% ownership of JCU – See Denison news release dated August 3, 2021.

(3) Reflects Denison's effective interest, including a portion attributable to Denison's 50% ownership in JCU (Canada) Exploration Company, Limited. See Denison's news release dated August 3, 2021.

Wheeler River Project

McArthur River Mine

ALTA
2023²⁷
ALBERTA

Gryphon Deposit
Discovered 2014

Phoenix Deposit
Discovered 2008

Provincial highway & powerline

Key Lake Mill



10 km

PHOTO:

Aerial view of Denison's 95.0 % owned Wheeler River Project. Highlighting the Phoenix and Gryphon deposits relative to existing infrastructure.

Summarized History of the Wheeler River Project⁽¹⁾⁽²⁾: Approaching two decades of investment and management by Denison



2004-2007

Denison earns 60% ownership interest and becomes project operator



2008-2014

Phoenix is discovered by testing resistivity anomaly drill targets

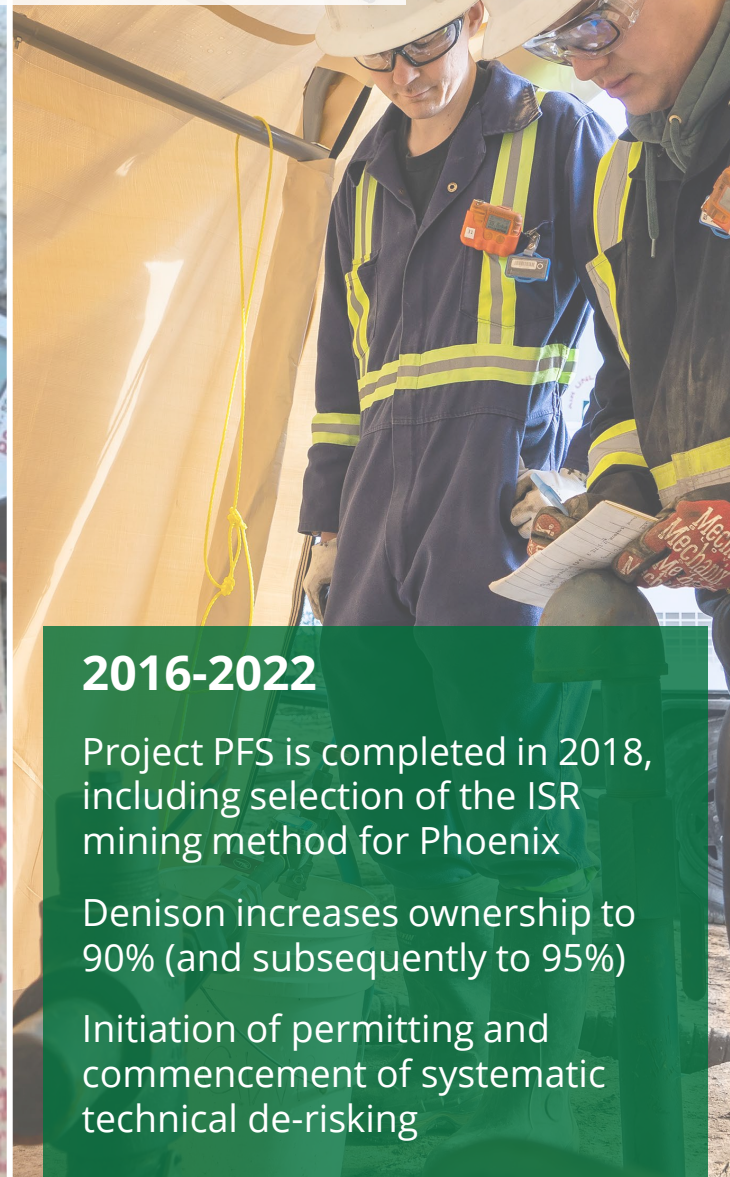
Deposit is delineated



2014-2016

Gryphon is discovered

Project PEA is completed in 2016



2016-2022

Project PFS is completed in 2018, including selection of the ISR mining method for Phoenix

Denison increases ownership to 90% (and subsequently to 95%)

Initiation of permitting and commencement of systematic technical de-risking

PHOTOS (Left to Right):

Drill rig carrying out exploration at the Wheeler River site in the mid 2000s; Core logging from discovery of Phoenix; Drill core and handheld scintillometer from discovery of Gryphon; monitoring of commercial scale ISR test wells at Phoenix in 2021.

NOTES:

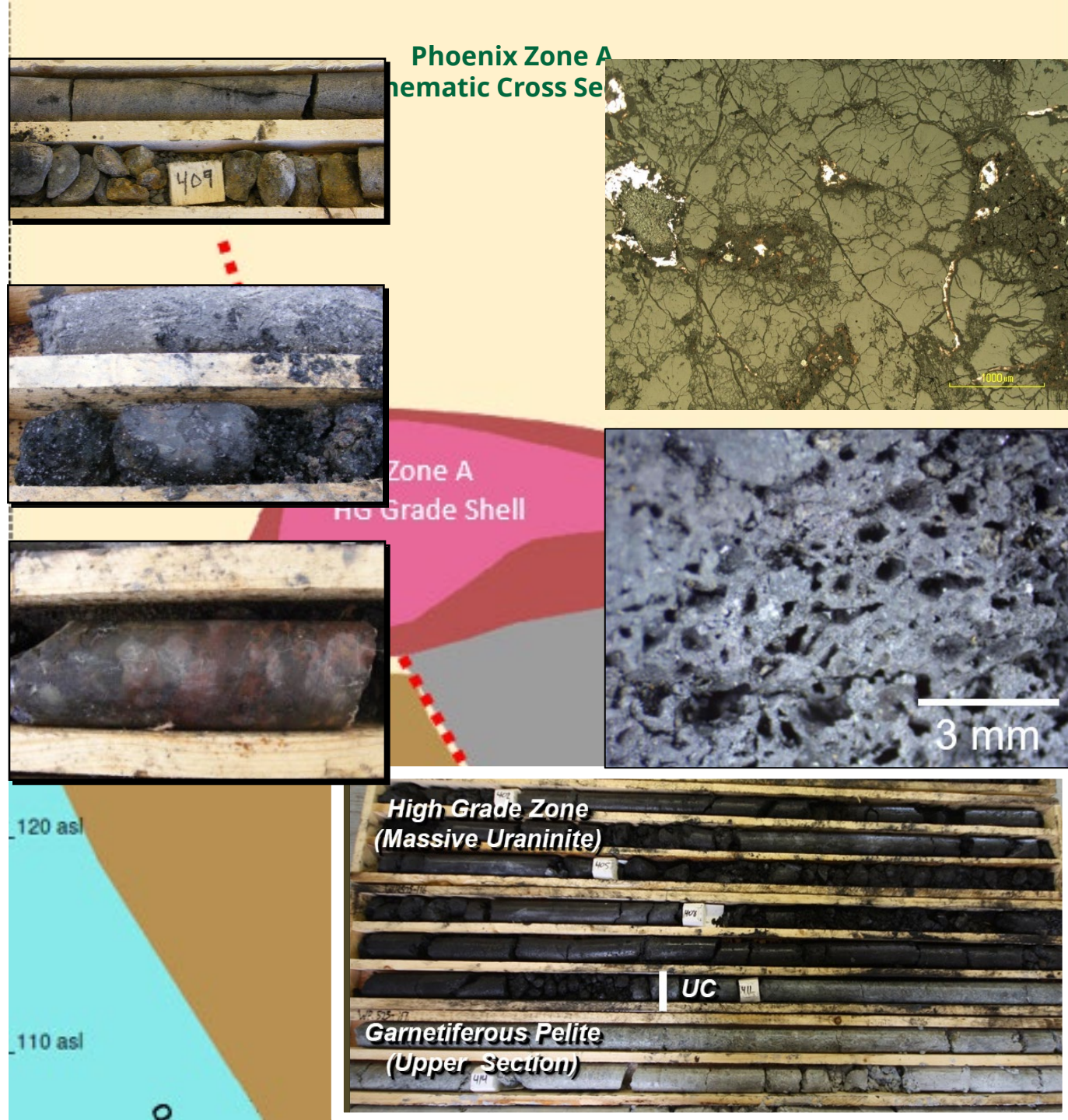
(1) See Denison's current Annual Information Form for additional details regarding the history of the Wheeler River project.

(2) The source for uranium price data included on this slide is UxC LLC.

Phoenix Geology:

Unique uranium deposit with exceptionally high grades

- **Highlights⁽¹⁾:**
- Mineralization is situated at or immediately above the unconformity ("UC")
- Two distinct zones – Phoenix A + B
- Approximately 400m below surface
- World's highest-grade undeveloped uranium deposit
- **70.2 million pounds U_3O_8 @ 19.14% U_3O_8**
Indicated mineral resources (166,400 tonnes)⁽²⁾
 - Zone A High-Grade Core contains an estimated **59.9 M lbs U_3O_8 @ 43.2% U_3O_8** (62,900 tonnes)
 - Cut-off grade of 0.8% U_3O_8
 - 1.1M lbs U_3O_8 in Inferred mineral resources (8,600 tonnes @ 5.8% U_3O_8)⁽³⁾
- ✓ **Geological setting expected to be amenable to ISR mining, with ~90% of the mineral resource (contained metal) hosted in sandstone**



NOTES:

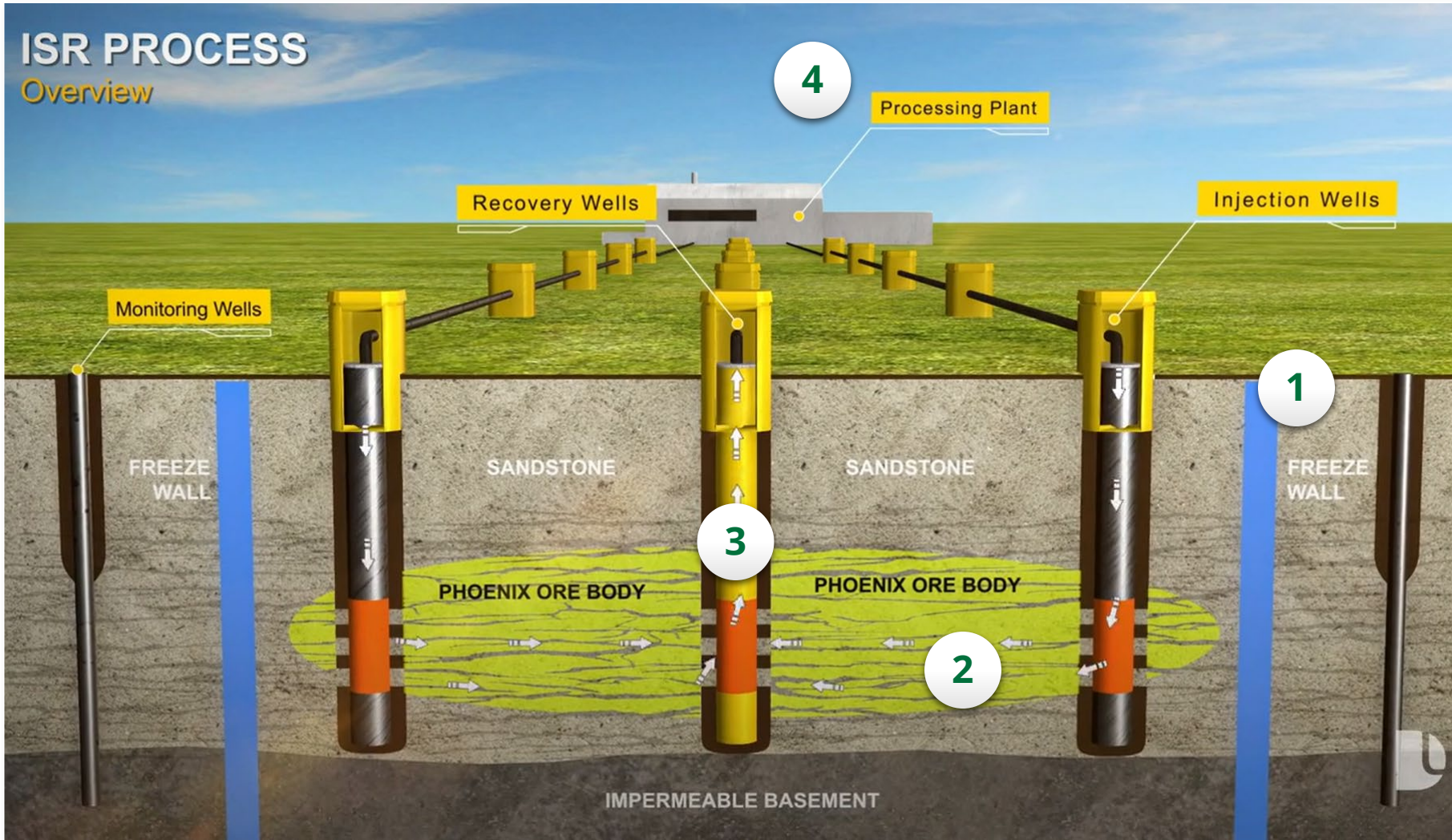
(1) Refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018;

(2) Indicated resources are inclusive of Reserves

(3) The PFS does not include any economic analysis based on estimated Inferred resources.

Phoenix ISR De-Risking:

First principles of successful ISR mining in the Athabasca Basin

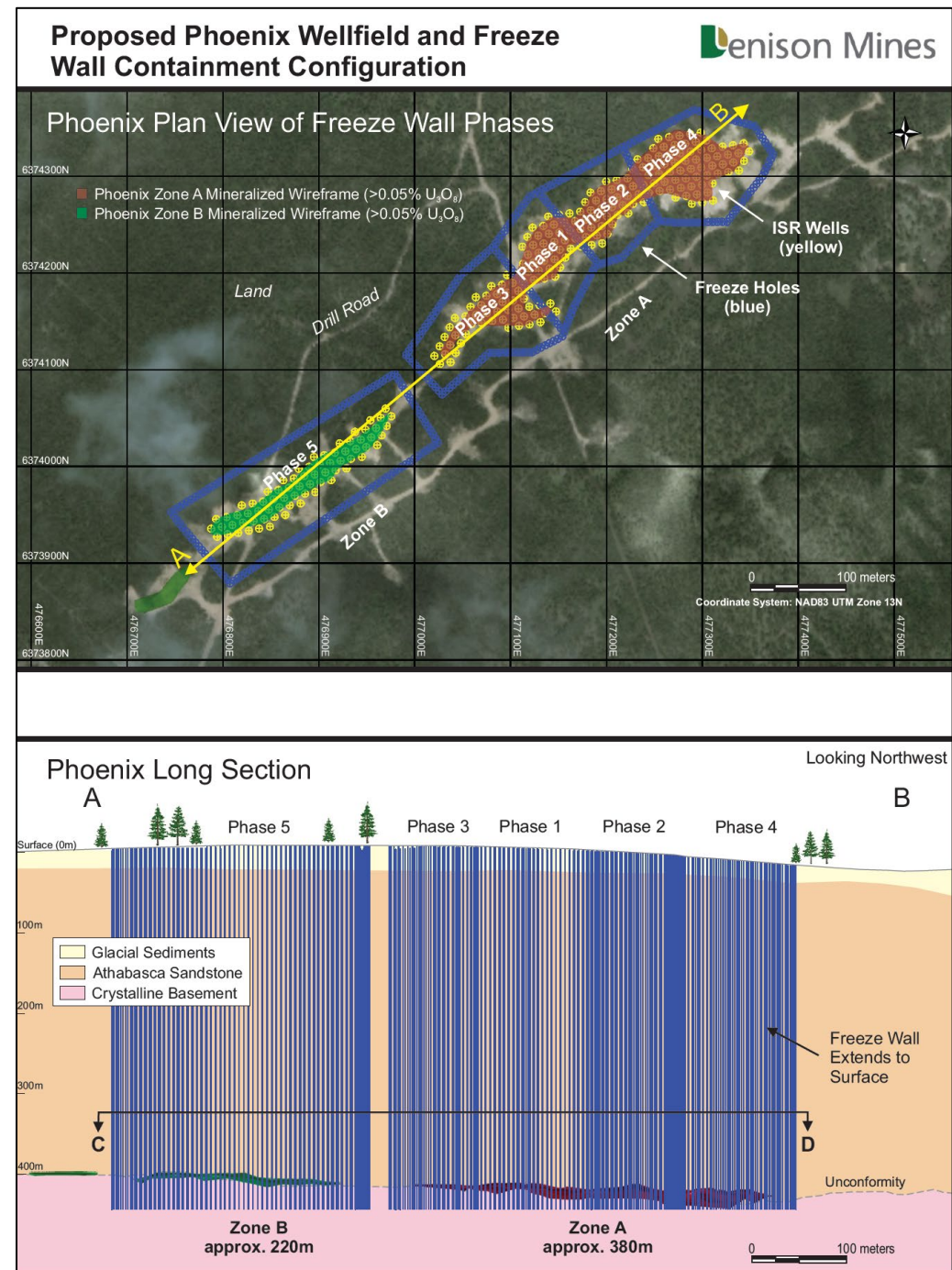


- 1. Containment:** ability to contain the mining solution injected into the formation
- 2. Permeability:** ability to establish hydraulic connections between injection and recovery wells to move the mining solution throughout the deposit
- 3. Leachability:** ability to complete leaching of the uranium mineralization while it is in the ground (in-situ);
- 4. Processing:** ability to recover a suitable finished product from the uranium bearing solution recovered from the wellfield.

Phoenix De-Risking:

Conventional freeze wall design adopted for Phoenix ISR to replace novel freeze cap / dome design

- **Post-PFS trade-off study supports decision to adopt freeze wall design to provide hydrogeologic containment⁽¹⁾**
- Parallel vertical cased holes drilled from surface and anchored into impermeable basement rock surrounding the Phoenix deposit
- Circulation of low-temperature brine solution through cased pipes will freeze groundwater in sandstone surrounding the deposit
- 10-metre-thick freeze wall, together with basement rocks will encompass Phoenix vertically from surface to basement rock underlying the deposit
- ✓ **Eliminates common environmental concerns with ISR mining and facilitates controlled reclamation**



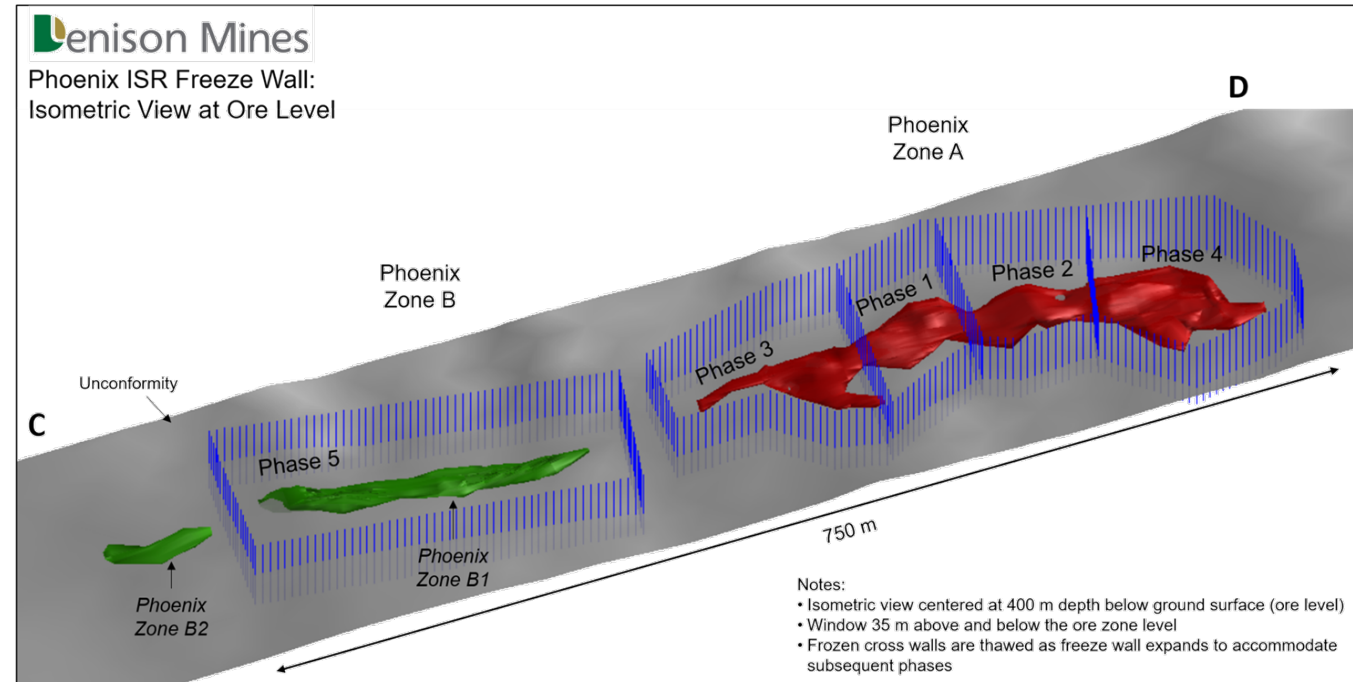
NOTES:

(1) See Denison's news release dated December 1, 2020 for additional information on the freeze wall design for Phoenix.

Phoenix De-Risking:

Freeze wall design shows potential for significant advantages⁽¹⁾⁽²⁾

- ✓ **Enhanced environmental design**
 - Full hydraulic containment of ISR well field to surface
 - Defined area for reclamation
- ✓ **Lower technical complexity and operational risk**
 - Existing diamond drilling methods
 - Reduction of intersection of freeze holes and ISR wells⁽¹⁾
- ✓ **Expected reduction in initial capital**
 - Lower cost drilling
 - Phased mining approach
- ✓ **Strengthened project sustainability**
 - Diamond drilling widely employed in northern Sask.
 - Ability to leverage existing skilled workforce
 - Drilling over life of mine



NOTES:

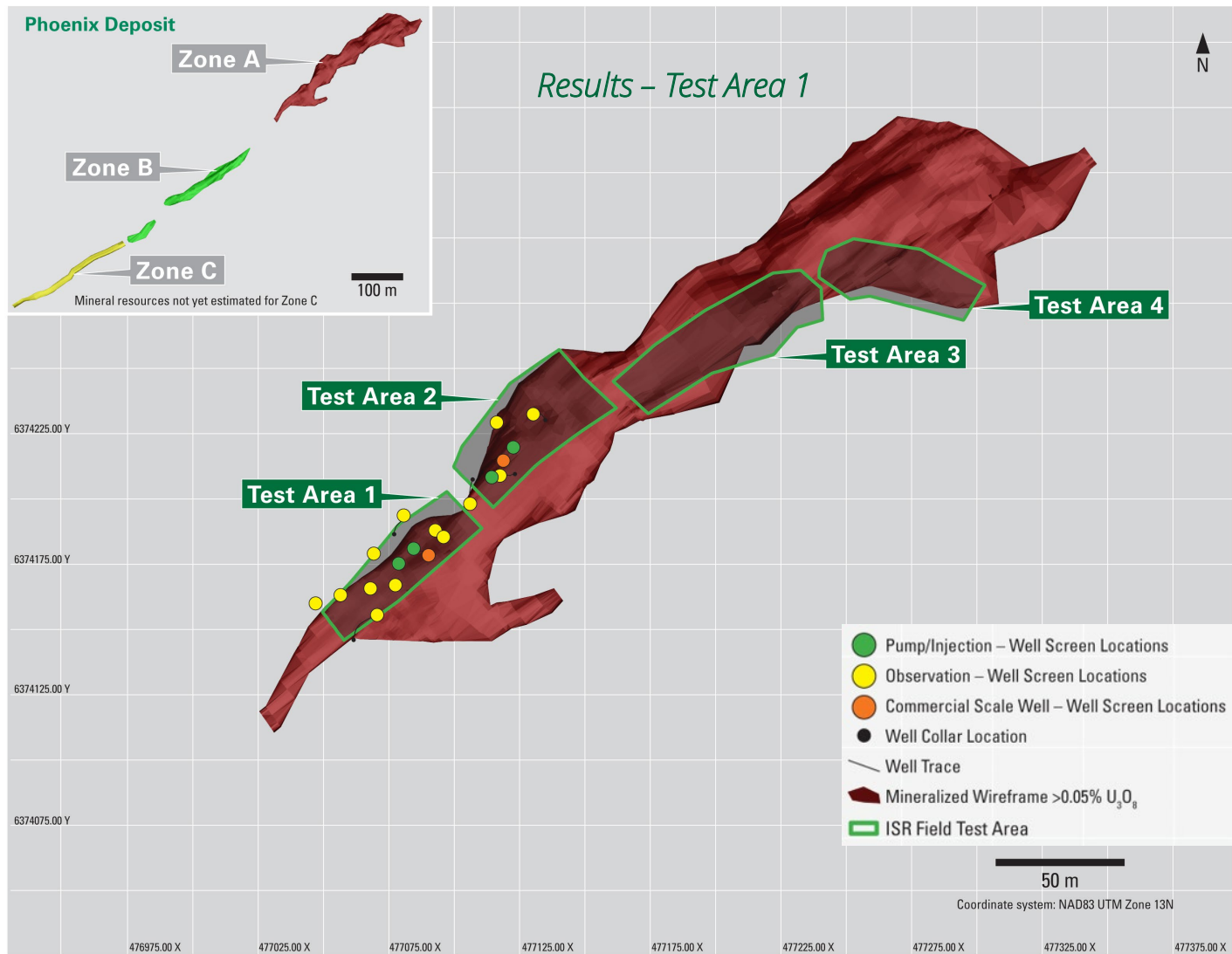
(1) For additional information on horizontal freeze cap design included in PFS, refer to the Wheeler River Technical Report titled "Pre-feasibility Study Report for the Wheeler River Uranium Project, Saskatchewan, Canada" dated September 24, 2018

(2) See Denison's news release dated December 1, 2020 for additional information on the freeze wall design for Phoenix.

Phoenix ISR Field Test Program

Preliminary Test Work

Phoenix Zone A Plan View – ISR Field Test Areas



- ✓ Initial ISR Field Test work (2019-2020)
- ✓ De-risking permeability
- ✓ Installation of several **small diameter wells** ("SMWs") utilizing existing exploration boreholes
- ✓ Athabasca Basin's first large-diameter **Commercial Scale Wells** ("CSWs") designed for commercial ISR production
- ✓ Long-duration **hydrogeological tests** allowed for the characterization of fluid flow under conditions similar to an envisioned commercial production environment

NOTES:

(1)) See Denison's news release dated August 27 2019, September 19 2019 and October 31, 2019 for additional information on the ISR field test work.

Phoenix ISR Field Test Program: *Installation of Small Diameter Wells⁽¹⁾*



PHOTO:

ISR field testing at Wheeler River Phoenix Deposit, Summer 2019

NOTES:

(1) See Denison's news release dated August 27 2019, September 19 2019 and October 31, 2019 for additional information on the ISR field test work.

Phoenix ISR Field Test Program: *Advancement to installation of Commercial Scale Wells⁽¹⁾*



PHOTO:

CSW being installed at
Wheeler River Phoenix
Deposit, Summer 2901

NOTES:

(1)) See Denison's news
release dated August 27
2019, September 19 2019
and October 31, 2019 for
additional information on
the ISR field test work.

Phoenix ISR De-Risking: 2019 and 2020 ISR field test programs⁽¹⁾⁽³⁾



~35 small- diameter wells

installed into
and around the
Phoenix deposit

All holes
generally
equipped with a
down-hole
pressure
transducer or
vibrating wire
piezometer
(“VWP”) to
measures
hydraulic
pressure during
test work

Two large- diameter commercial- scale wells

First installed in
the history of
the Athabasca
Basin

Containment:

Tests show
minimal vertical
travel of injected
fluids

Support decision
to adopt “Freeze
Wall” design⁽⁴⁾

~40 Pump and injection tests

completed to
collect extensive
data for
development of
hydrogeologic
model

Permeability:

Hydrogeologic
model build and
calibrated by
third-party

Achieved ISR
“**Proof of
Concept**”⁽²⁾

PHOTOS:

ISR field testing at
Wheeler River Phoenix
Deposit, Summer 2019.

Inset photo shows close
up view of downhole
pressure transducer.

NOTES:

(1) See Denison’s news
release dated Dec.18,
2019.

(2) See Denison’s news
release dated June 4,
2020.

(3) See Denison’s news
release dated Oct. 28,
2020.

(4) See Denison’s news
release dated Dec. 1,
2020.

“Proof of Concept” Achieved for Application of ISR Mining Method at Phoenix⁽¹⁾

- **Comprehensive hydrogeologic model:** Developed, using 2019 ISR Field Test data
- **Calibrated:** models compared to actual 2019 Field Test data, such that the "head" changes resulting from simulations in the models were similar to observed changes in the actual field tests
- **Parameters:** 18 extraction / recovery wells and 33 injection wells modelled across Test Area 1 and Test Area 2, nearly balanced operational flow; 180-day simulation was completed with approximately 80% of the injected fluids estimated to be captured during the simulation period
- **Report Conclusions:** modelling provided **“Proof of Concept”** for application of ISR to Phoenix with respect to potential extraction and injection rates
- **2020 ISR Field Test Program:** Developed to further validate the model completed by Petrotek, and to prepare for field tests in future years, using existing test wells in Test Area 1 and Test Area 2



NOTES:

(1) See Denison's news release from June 4, 2020 for details

PHOTO:

ISR field testing at Wheeler River Phoenix Deposit, Summer 2019

Phoenix ISR De-Risking: Commercial-scale test pattern and tracer test⁽¹⁾



5-spot large- diameter commercial scale test pattern

installed in
expected Phoenix
mining Phase 1

Tracer Test

First known
completed ion
tracer test for
ISR mining in
the history of
the Athabasca
Basin

Permeability Enhancement Tools Tested

On a larger-scale
than previous
tests, verifying
increased
hydraulic
connection
where needed

Highlights of highly successful tracer test:

- ✓ Achieved commercial-scale production flow rates
- ✓ Demonstrated hydraulic control of injected solution
- ✓ Established breakthrough times consistent with hydrogeological modelling
- ✓ Completed 'clean-up' phase consistent with hydrogeological modelling

PHOTOS:

ISR test pattern and commercial scale well-head (inset) at Phoenix during field tests / tracer test completed in 2021.

LINKS:

[2021 ISR Field Test Video](#)

NOTES:

(1) See Denison's news release dated Oct. 28, 2021

Phoenix ISR De-Risking:

Validating in-situ leachability through specialized metallurgical testing



Core Leach Testing

Saskatchewan Research Council ('SRC') uses a specialized 'core leach' machine to simulate in-situ leach conditions by forcing the leach solution through the natural permeability of multiple representative in-tact core samples

50% increase in ISR mining head grade⁽¹⁾

Core leach test results support decision in 2021 to increase the mining head grade assumed in the 2018 PFS

Hydro-metallurgical test work

Progressing to support water effluent quality for ongoing environmental assessment.

Plant design advancing

Metallurgical testing using roughly 1000L of uranium bearing solution to support bench-scale evaluations for plant design is well advanced

PHOTOS:

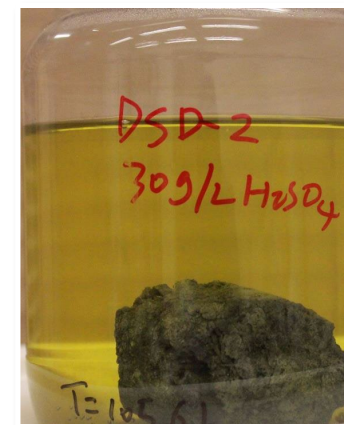
Specialized 'Core Leach' apparatus at the SRC labs in Saskatoon.

Inset photo shows 9" sample of in-tact high-grade drill core from Phoenix prior to insertion into the testing apparatus.

Bottom right, shows static leaching of uranium from undisturbed core sample.

NOTES:

(1) See Denison's news release dated August, 4, 2021.



Fully Permitted In-Situ Recovery Feasibility Field Test (FFT): Multiple catalysts from first-of-its-kind test in the Athabasca Basin^(1, 2)



The Phoenix FFT was designed to validate and inform various feasibility study elements for use of **In-Situ Recovery (ISR)** mining, including production and remediation profiles, and is planned to occur in three phases. The first phase commenced in **H2'2022**:

Leaching

Completed ✓
successful injection of acidic solution and recovery of uranium bearing solution using a portion of the test pattern installed at Phoenix in 2021⁽³⁾.

Neutralization

Completed ✓
successful injection of mild alkaline solution to reverse the leaching process and return test area to protective conditions⁽⁴⁾.

Recovered Solution Management

Separation of recovered solution into mineralized precipitates (temporarily stored in tanks on surface) and neutralized treated solution (re-injected into sub-surface).



PHOTO:

Inside FFT coverall structure during commissioning – including view of commercial scale test wells, monitoring wells, and injection solution preparation module (left) and plan map of Phoenix FFT site (right).

NOTES:

(1) See Denison's news release dated July 12, 2022.

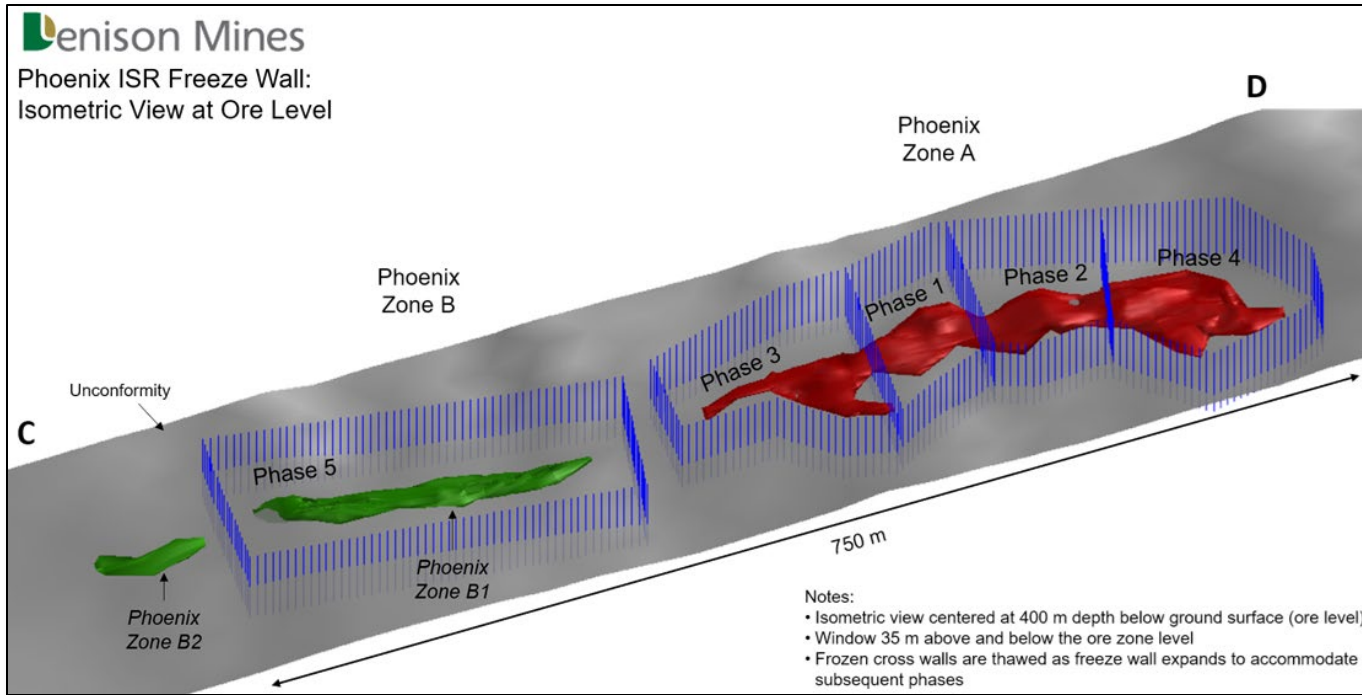
(2) See Denison's news release dated August 8, 2022.

(3) See Denison's news release dated October 17, 2022.

(4) See Denison's news release dated December 12, 2022.

Phoenix ISR Feasibility Study:

Wood PLC selected to lead + author independent Feasibility Study in accordance with NI 43-101⁽¹⁾



**50%
increase**

to ISR mining
uranium head-
grade in PFS⁽³⁾

Updated

Estimate of
Mineral Resources

including results
from GWR-045⁽⁴⁾
and GWR-049⁽⁵⁾

**Process
Plant
Optimization**

Including increase
in ISR mining
head-grade

**Mine
Design
Optimization**

Including results
from multiple
field tests

PHOTO:

Isometric view of planned
ISR Freeze Wall for
Phoenix, including
illustration of phased
mining approach

NOTES:

(1) See Denison's news
release dated September
22, 2021.

(2) See Denison's news
release dated December
1, 2020.

(3) See Denison's news
release dated August 4,
2021.

(4) See Denison's news
release dated July 29,
2021.

(5) See Denison's news
release dated Feb. 16,
2022.

Freeze wall design shows potential for significant advantages⁽²⁾

Conventional freeze "wall" design
selected to replace novel freeze
dome / cap design in 2018 PFS

- Enhanced environmental design – full containment of ISR wellfield to surface
- Lower technical complexity and operational risk – using existing diamond drilling methods
- Expected reduction in initial capital costs with introduction of phased mining approach
- Strengthened project sustainability

Superior
Standard of
Environmental
Stewardship

Incorporating
technical work
and feedback
from ongoing EA

Class 3
Capital
Cost Estimate

AACE
international
standard with an
accuracy of
-15%/+25%



Thank You

 **ALTA**
2023 
30 April - 6 May | Perth, Australia