

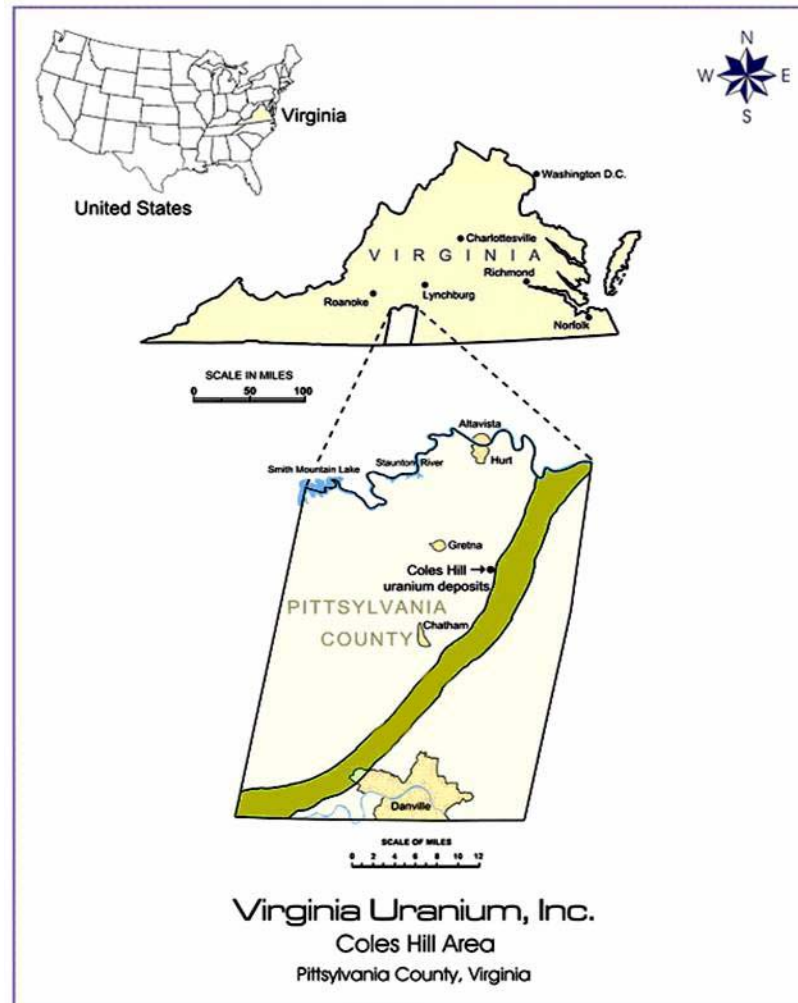


***“Coles Hill Uranium Deposit – Then & Now”***

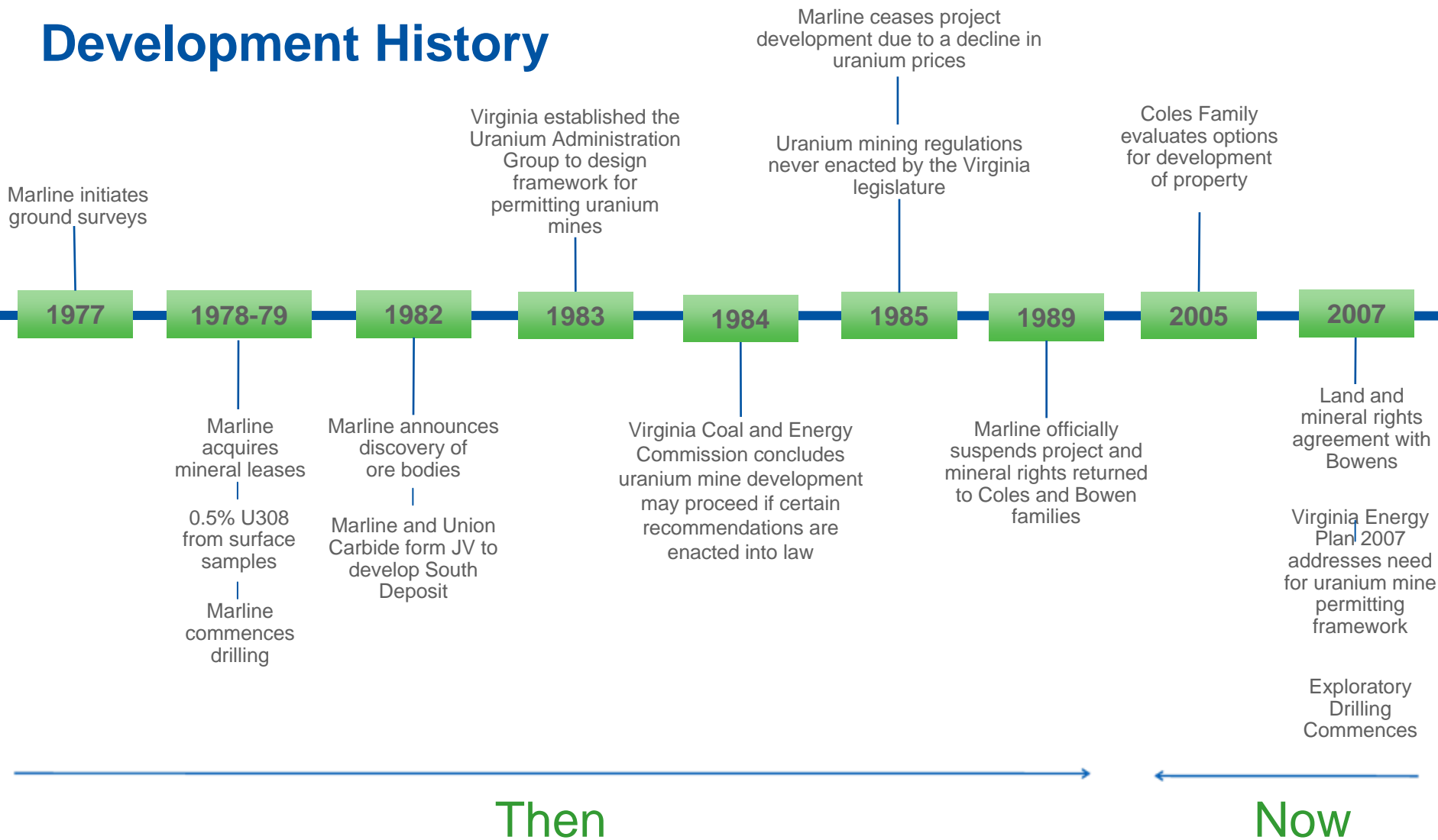
**JOINT MEETING VA-ANS & VA-HPS**

September 18, 2008

## Coles Hill Uranium Deposit Location – Pittsylvania Co, VA

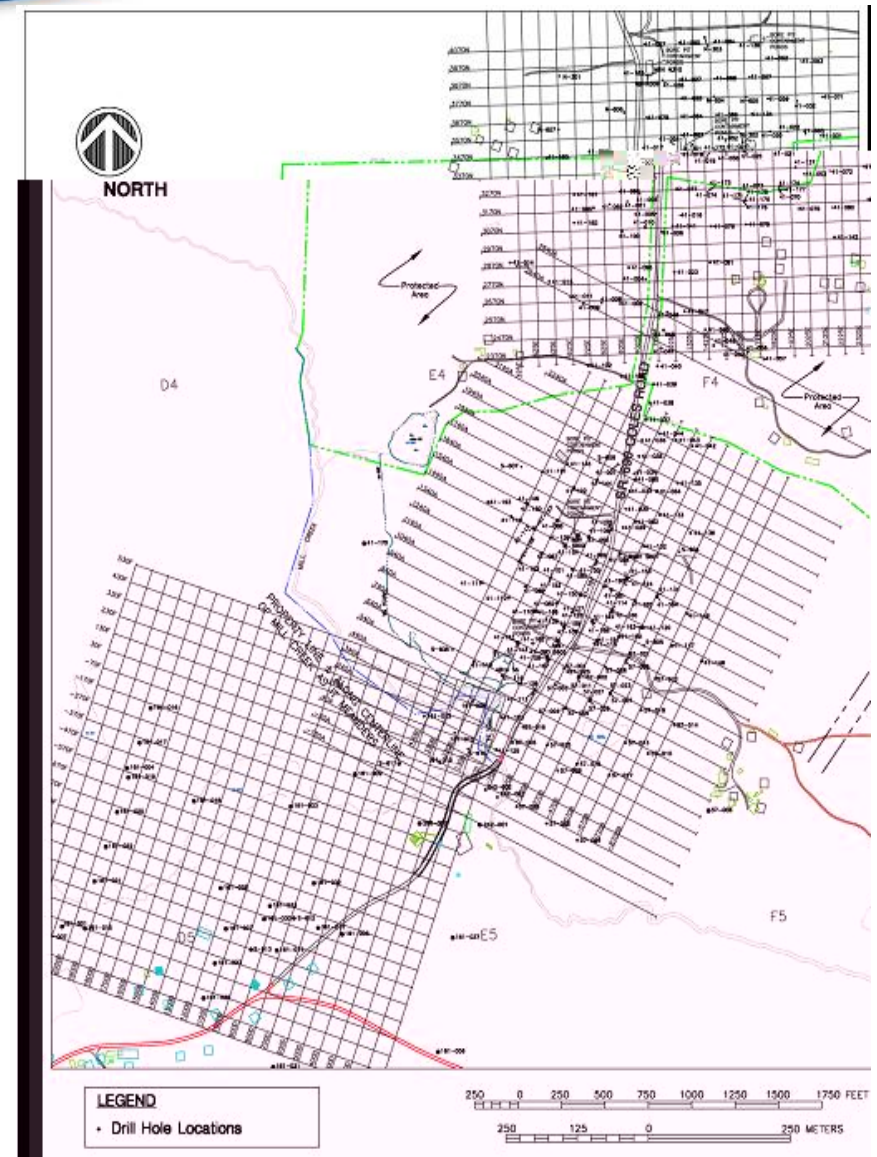


# Development History



## DRILL HOLE LOCATIONS

- Marline and Union Carbide drilled 210 holes to define the deposits
  - ❖ 153 rotary percussion
  - ❖ 57 diamond drill holes
- \$43 million in expenditures (1982 dollars)
- Over 65,000 feet of drill core on site



## Historical Development Activity

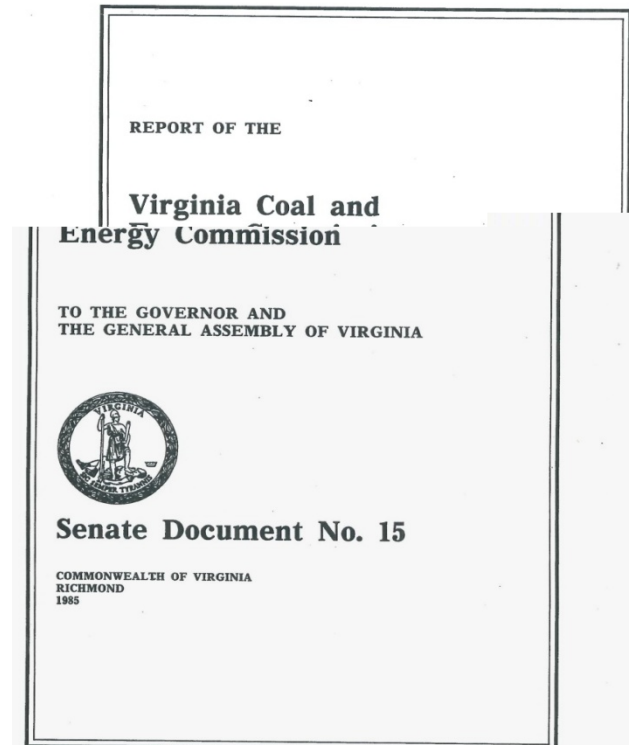
- Marline submitted an Evaluation Study by Dravo Engineers in 1983, including work by the following respected consultants:
  - Pincock Allen & Holt completed historic resource studies
  - Gibbs and Hill provided ecological and radiological baseline studies
  - Western Resource Development Corporation for ecological studies
  - Noel Savignac for radiological studies
  - Chen and Associates for geotechnical and soils investigations
  - Environmental Systems for ground water hydrology and mine water treatment studies
  - Roman Pyrih and Associates for geochemistry
  - Metallurgical testing by Colorado School of Mines Research Institute
- Dames & Moore completed an Environmental Baseline Study in 1984
- Pre-feasibility study on South Coles Hill Deposit

## Marline Report to Virginia



## STUDIES – 1980's

- 1981: Virginia General Assembly approved House Joint Resolution No. 324 Requesting Virginia Coal & Energy Commission to evaluate effects of Uranium Development
- 1983: Uranium Administrative Group (UAG) established to assist Virginia Coal & Energy Commission
- 1984: UAG & Uranium Sub-Committee of Coal & Energy Commission & Interagency Task Force



***Recommendation – “We conclude that the moratorium on uranium development can be lifted.”***

## Summary of Doses

<u>Receptor/Characteristics</u>	<u>Annual Whole Body Dose</u>
•NRC limit for general population (excluding background exposure and release from mines)	500 mrem
•Exposure to local residents from natural background radiation in vicinity of project prior to mining activity (dose equivalent due to external radiation & inhaled radon daughters)	210 mrem
•Coles Hill property (on mining site)	16.4 mrem
•Hypothetical off-site receptor with the largest potential exposure	7.8 mrem
•Hypothetical receptor nearest occupied dwelling	3.5 mrem
•Hypothetical receptor living in Halifax	0.15 mrem
•Dose to hypothetical average receptor of the population currently living w/in 50 miles of project.	0.04 mrem

# ASSESSMENT OF RISK FROM URANIUM MINING IN VIRGINIA

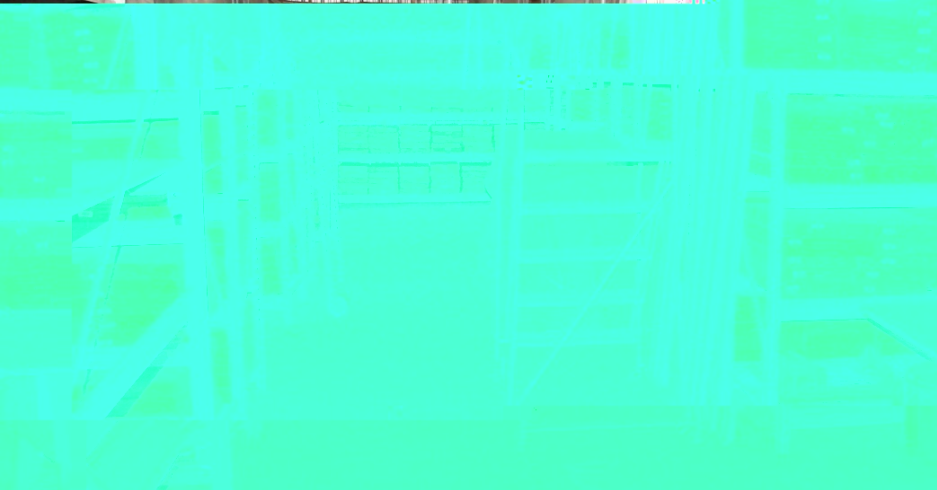
Prepared by

The Coal and Energy Commission  
Commonwealth of Virginia

September 1984

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Box No.	Job Name	Box No.	Job Name
Box- 5100N	41-12700N	Box- 5700N	41-12700N
NX 495.7	495.7	NX 572.0	572.0
Box- 5100N	41-12700N	Box- 5800N	41-12700N
NX 495.7	495.7	NX 581.5	581.5
Box- 5100N	41-12700N	Box- 5900N	41-12700N
NX 505.3	505.3	NX 591.0	591.0
Box- 5500N	41-12700N	Box- 6000N	41-12700N
NX 543.8	543.8	NX 600.4	600.4
Box- 5600N	41-12700N	Box- 6100N	41-12700N
NX 553.4	553.4	NX 610.4	610.4

## AEC

- AEC – Atomic Energy Commission

- ❖ AEC established after WWII to oversee peace time development of atomic science and technology
- ❖ 1946 - Nuclear Regulations established under the Atomic Energy Act of 1946.
- ❖ 1954 - Law was replaced with Atomic Energy Act of 1954
  - allowed development of commercial nuclear power
  - encouraged the use of nuclear power

## NRC

### NRC – Nuclear Regulatory Commission

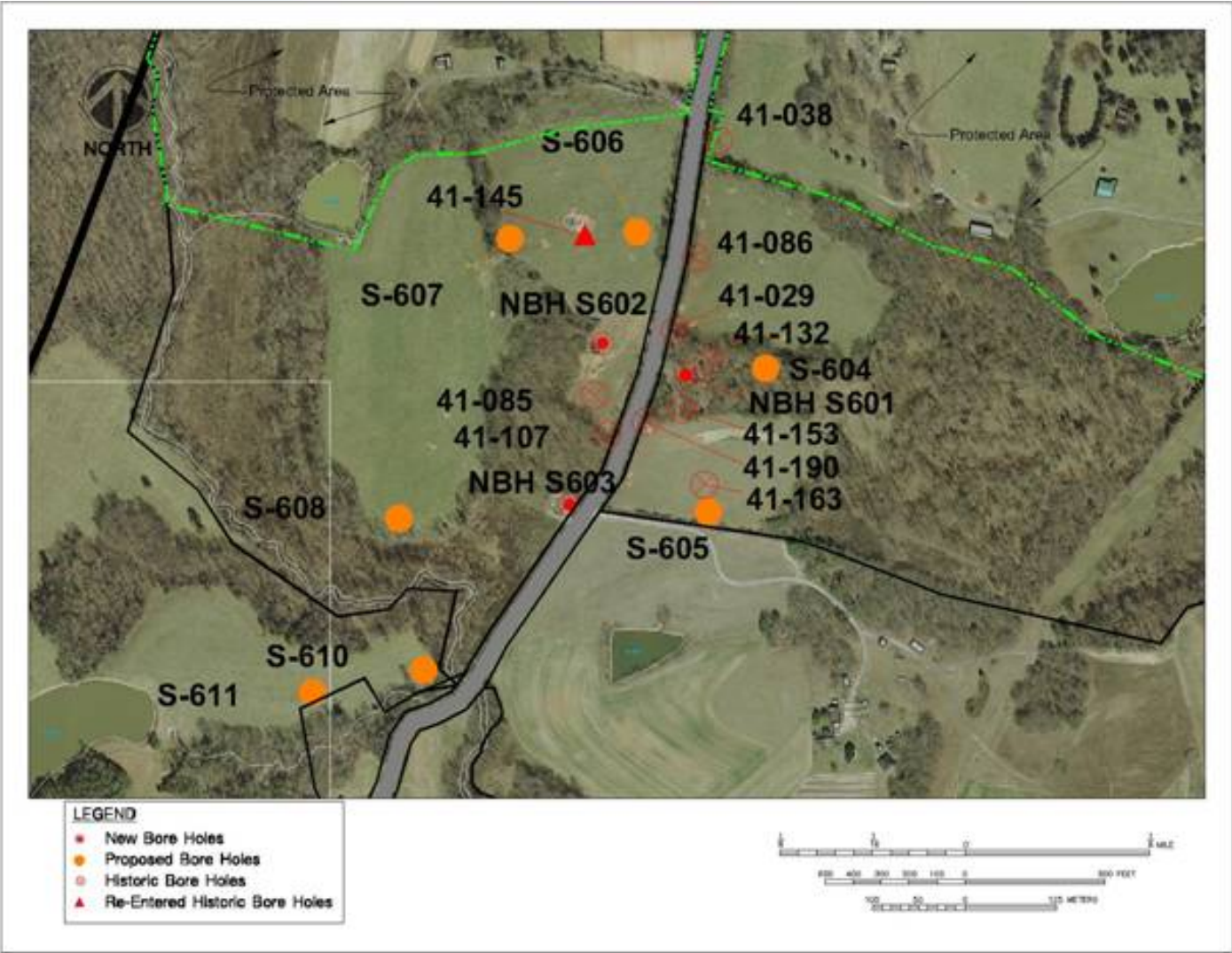
- ❖ 1974 – NRC was created to replace the AEC
- ❖ January 19, 1975 – NRC began operations
  - Focused attention on several broad issues regarding protection of public safety and health.
  - Mission was to regulate the use nuclear materials and to ensure adequate protection of public health and safety.

NRC's regulator activities today include ~

- ❖ Mill Siting
- ❖ Tailings Management Areas
- ❖ Mill & Tailings Past Closure

Headed by 5 Commissioners appointed by the President, confirmed by the Senate.

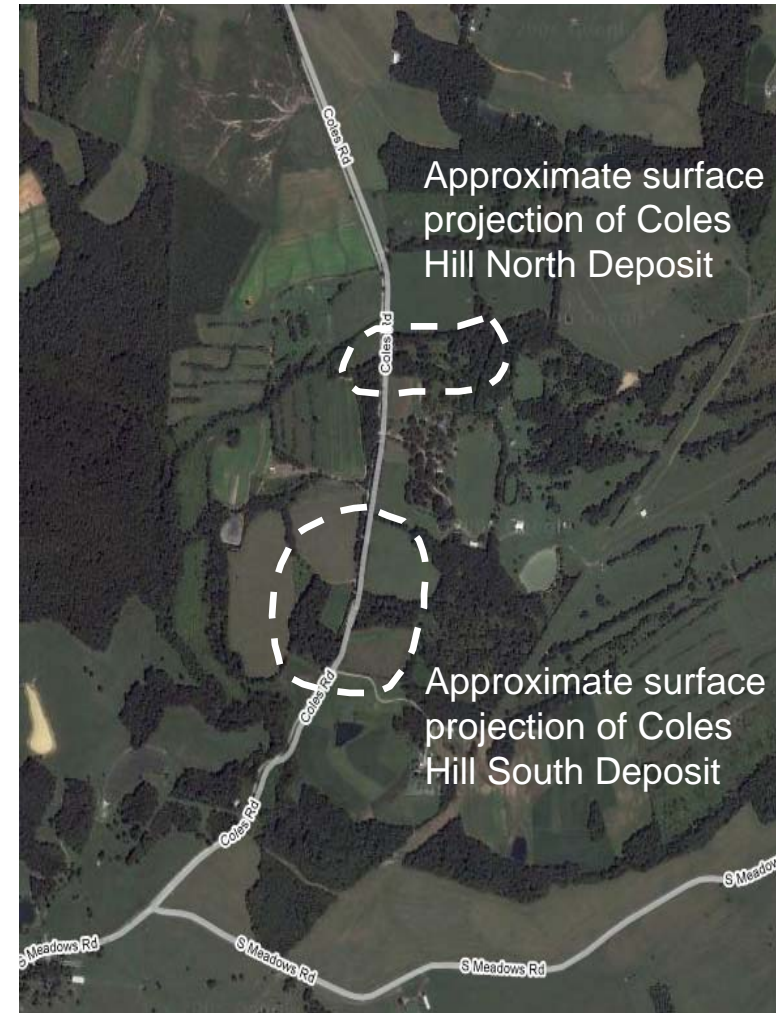
- ❖ *2007, received applications from utilities to build new power reactors – first time since the late 1970's*



## Vertical cross-section of South and North Deposits

## World Class Deposits

- One of only three mega-deposits in North America outside of Athabasca
- Two delineated ore bodies; North and South
- Combined historical resource of 110 million lbs  $U_3O_8$
- Higher grade zones near surface
- Potential for resource expansion along strike and at depth
- Close to roads, rail, gas pipeline, electricity and skilled labor



## Our size and grade compared to others in the United States

<b>Undeveloped Deposits in the United States</b>			
<b>Deposit</b>	<b>Grade % U3O8</b>	<b>Mine Method</b>	<b>Estimated Reserve (million lbs U3O8)</b>
<b>Coles Hill (Virginia)</b>	<b>0.06</b>	<b>OP/UG</b>	<b>119</b>
Skull Creek (Colorado)	0.30	UG	44
Nose Rock (New Mexico)	0.14	UG	40
Crownpoint/Unit 1 (New Mexico)	0.15	UG	39
Roca Honda (New Mexico)	0.20-0.23	UG	32
Churchrock (New Mexico)	0.10-0.12	UG	31
Lost Creek/Lost Soldier (Wyoming)	0.055-0.076	ISL	25
Copper Mountain (Wyoming)	0.03	UG	25
West Largo (New Mexico)	0.30	UG	17

## Undeveloped North American Deposits

- Believed to be one of the largest undeveloped uranium deposits in North America

- Total Grade:

Undeveloped Deposits in North America			
Deposit	Grade % U3O8	Mine Method	Estimated Reserve (million lbs U3O8)
Cigar Lake (Athabasca)	20.67	UG	226
Millenium (Athabasca)	3.77	OP	38
Shea Creek (Athabasca)	2.15	UG	28
Midwest (Athabasca)	2.00	OP	43
Dawn Lake (Athabasca)	1.69	OP/UG	13
Skull Creek (Colorado)	0.30	UG	44
West Largo (New Mexico)	0.30	UG	17
Kiggavik-Sisson Schultz (NW Territories)	0.24	OP	148
<b>Coles Hill (Virginia)</b>	<b>0.20</b>	<b>OP/UG</b>	<b>31</b>
Crownpoint/Unit 1 (New Mexico)	0.15	UG	39
Nose Rock (New Mexico)	0.14	UG	40
Roca Honda (New Mexico)	0.20-0.23	UG	32
Raven-Horseshoe (Athabasca)	0.14-0.17	UG	23
Churchrock (New Mexico)	0.10-0.12	UG	31
Michelin (Labrador)	0.06-0.12	OP/UG	58
<b>Coles Hill (Virginia)</b>	<b>0.08</b>	<b>OP/UG</b>	<b>110</b>
Copper Mountain (Wyoming)	0.03	UG	25
Lost Creek/Lost Soldier (Wyoming)	0.055-0.076	ISL	25

Source: UxC Consulting

UG = under-ground

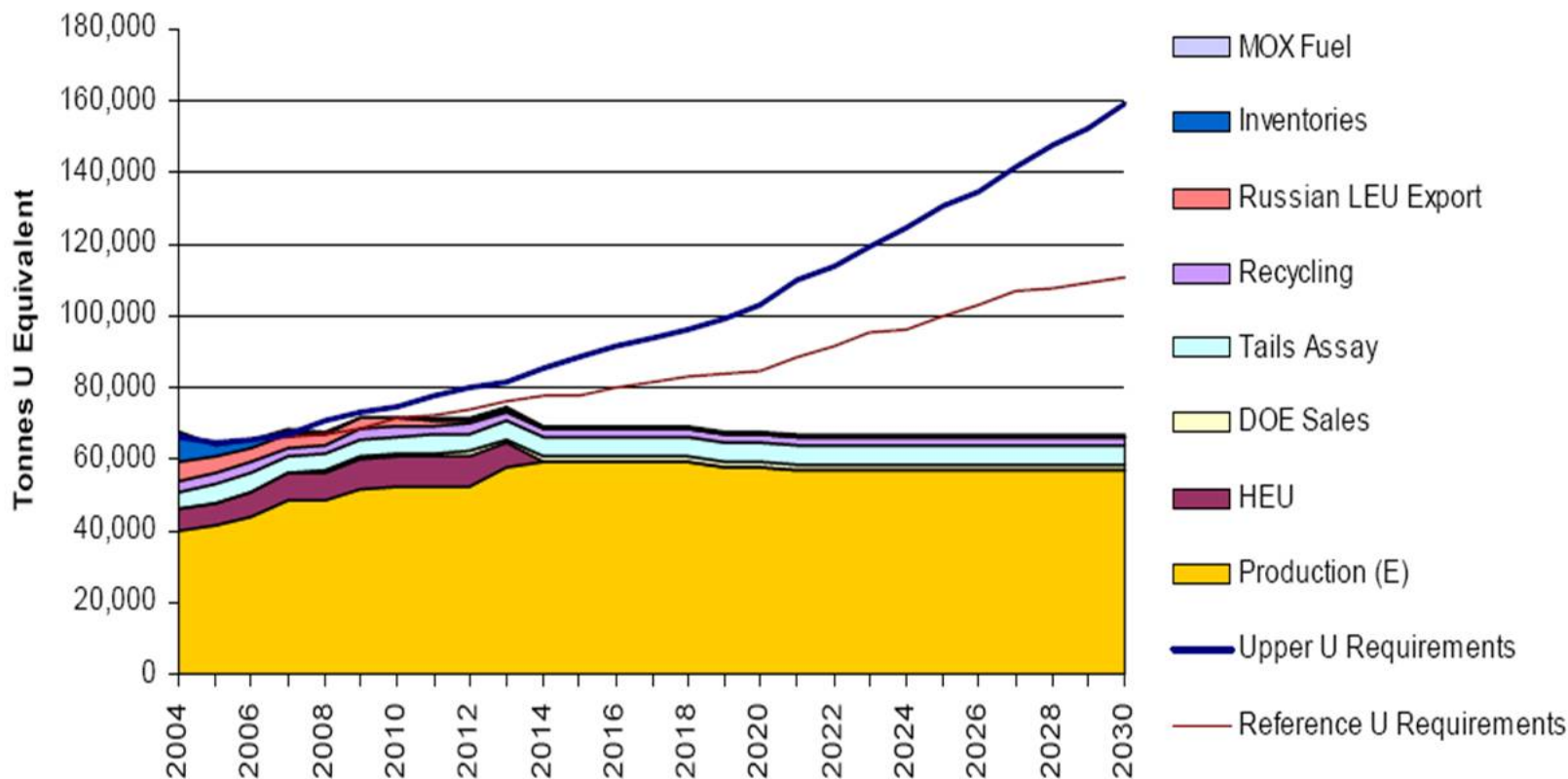
OP = open-pit

ISL = In-Situ Leach



# World Uranium Supply vs. Demand

**Figure 6** **Sprott Estimated Supply – Demand Scenario (2004 – 2030)**

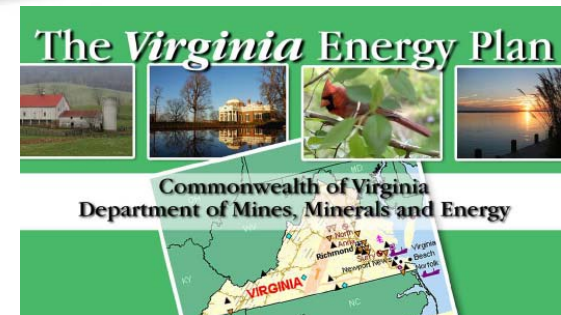


Source: WNA and Sprott Securities Inc. estimates

## Energy Independence

- Per US Government in 2006 (per DOE EIA)
  - US reactors provided about 20% of the nation's power supply
  - US reactors purchased 67 million lbs of  $U_3O_8$
  - US uranium mines produced 4.7 million lbs of  $U_3O_8$
- Per 2007 Virginia Energy Plan, Virginia reactors
  - Provided about 35% of Virginia's power supply
  - Annually consume about 1.6 million lbs of  $U_3O_8$ .
  - All uranium used in Virginia is imported. *(p.42)*

## Virginia 2007 Energy Plan



- “There are sufficient resources to support a uranium mining industry in Pittsylvania County with enough to meet the fuel needs of Virginia's current generation (see Chapter 2). **Significant work to assess the risk from mining and need for regulatory controls must be completed before any decision can be made whether such mining should take place.**” (p.101)
- “Although production of uranium is prohibited under state law and legislative action would be needed to lift this moratorium, uranium exploration activities are expected during the term of this Plan.” (p. 18)
- **“Virginia should assess the potential value of and regulatory needs for uranium production in Pittsylvania County.”** (p.169)
- **“Virginia should take steps during the term of this Plan to understand the environmental risks and identify controls needed if uranium mining were to be allowed.”** (p. 19)



## **Uranium Resources in Virginia World-Class Deposits**

[www.virginiauranium.com](http://www.virginiauranium.com)

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