Uranium Mining by In-Situ Recovery (ISR) Technology

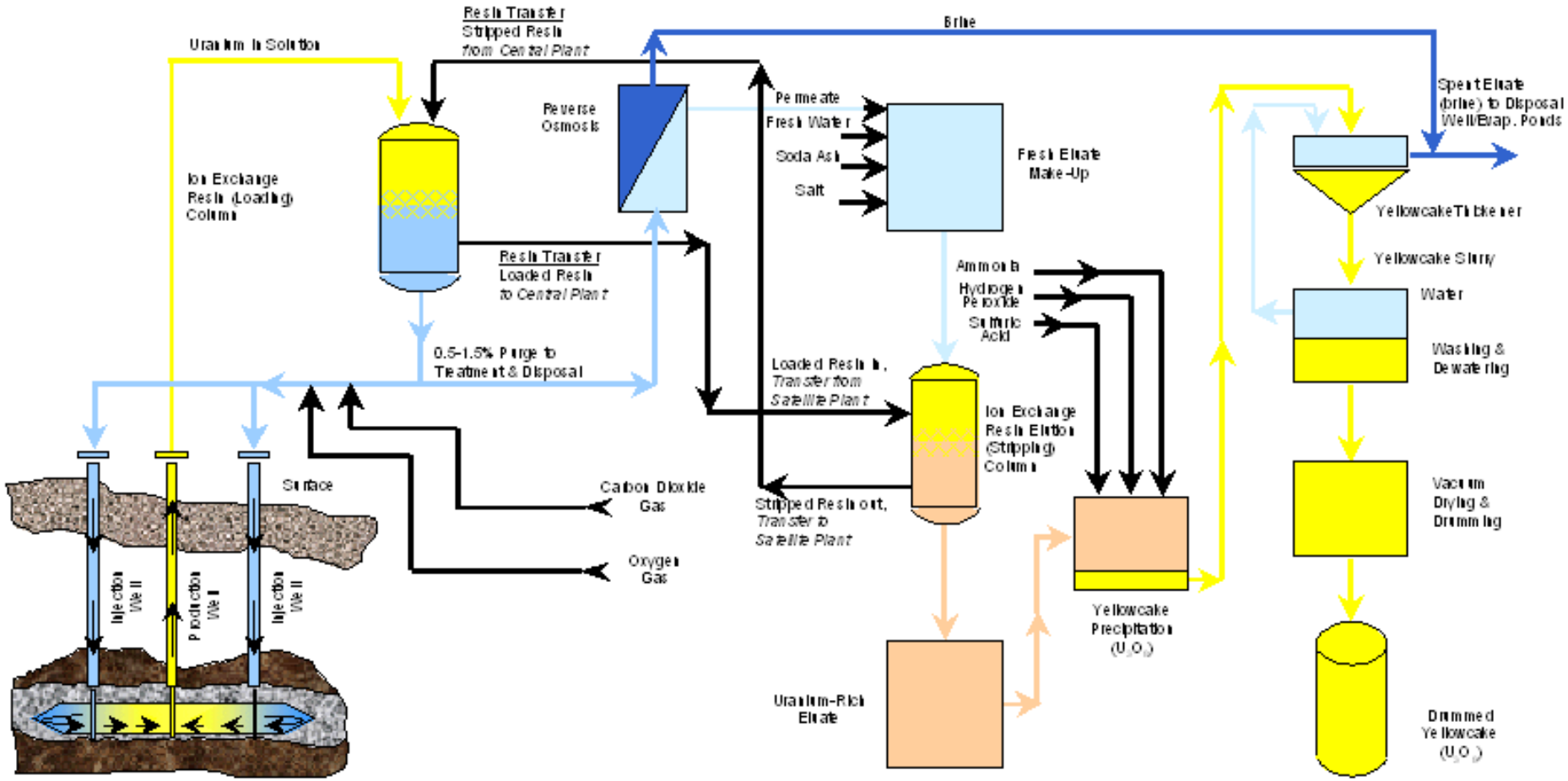
A summary review
prepared by
Bill Boberg
Ur-Energy Inc.
Littleton, Colorado

Uranium In-Situ Recovery (ISR) Mining

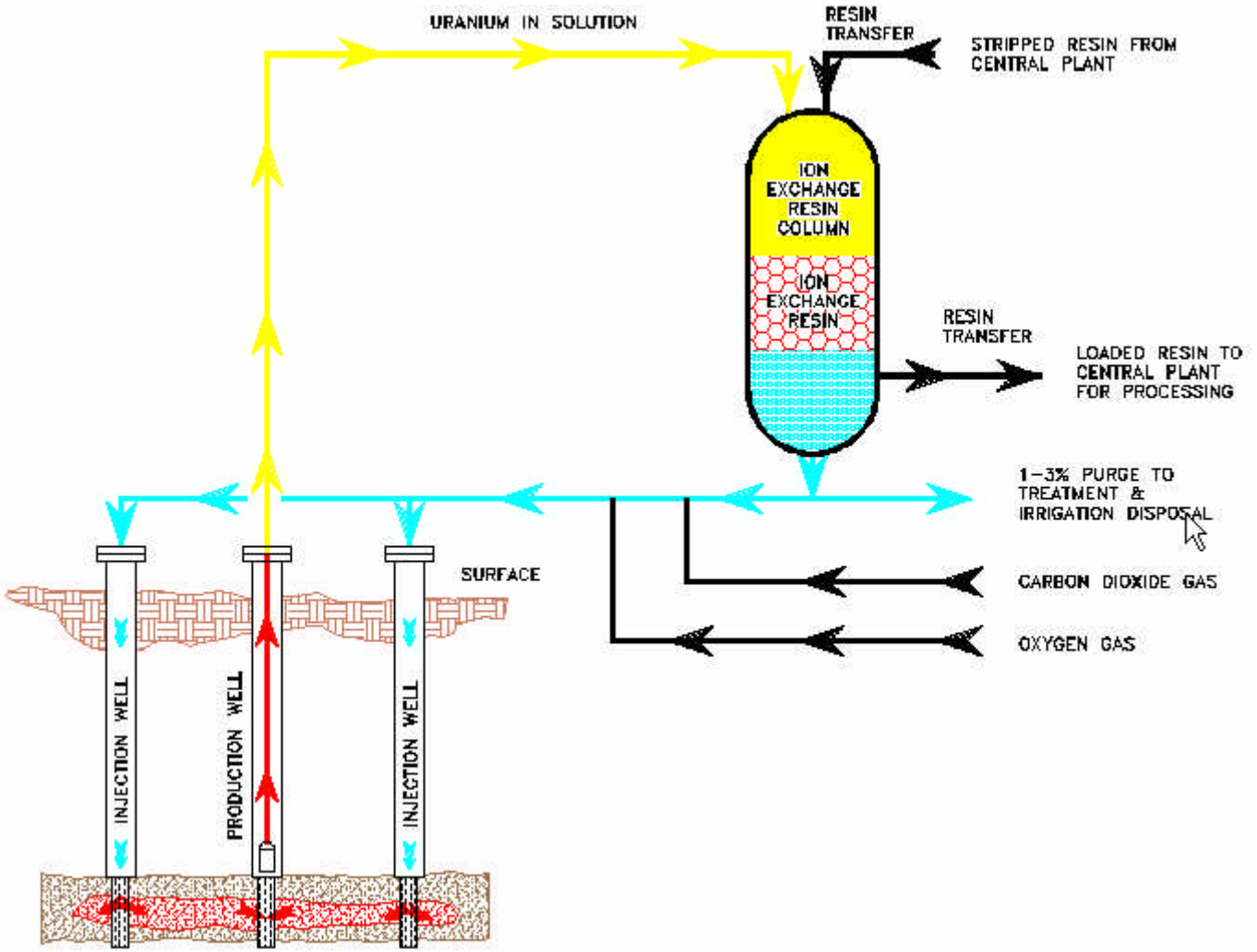
- Low capital costs ($20 to $35 million)
- Environmentally friendly (common solute is ground water enriched with oxygen and, if needed, carbon dioxide or bicarbonate of soda)
- Process essentially reverses the natural process by which the deposits were originally formed
- Works very good on solution front deposits in porous & permeable sandstones (Wyoming, Texas, Kazakhstan, Australia, etc.)
- Ideally 14 – 24 months mining, 24+ months ground water restoration and surface reclamation
- Production cost range - $18 to $25 per pound

Prepared by Bill Boberg, Ur-Energy, Inc. 2006

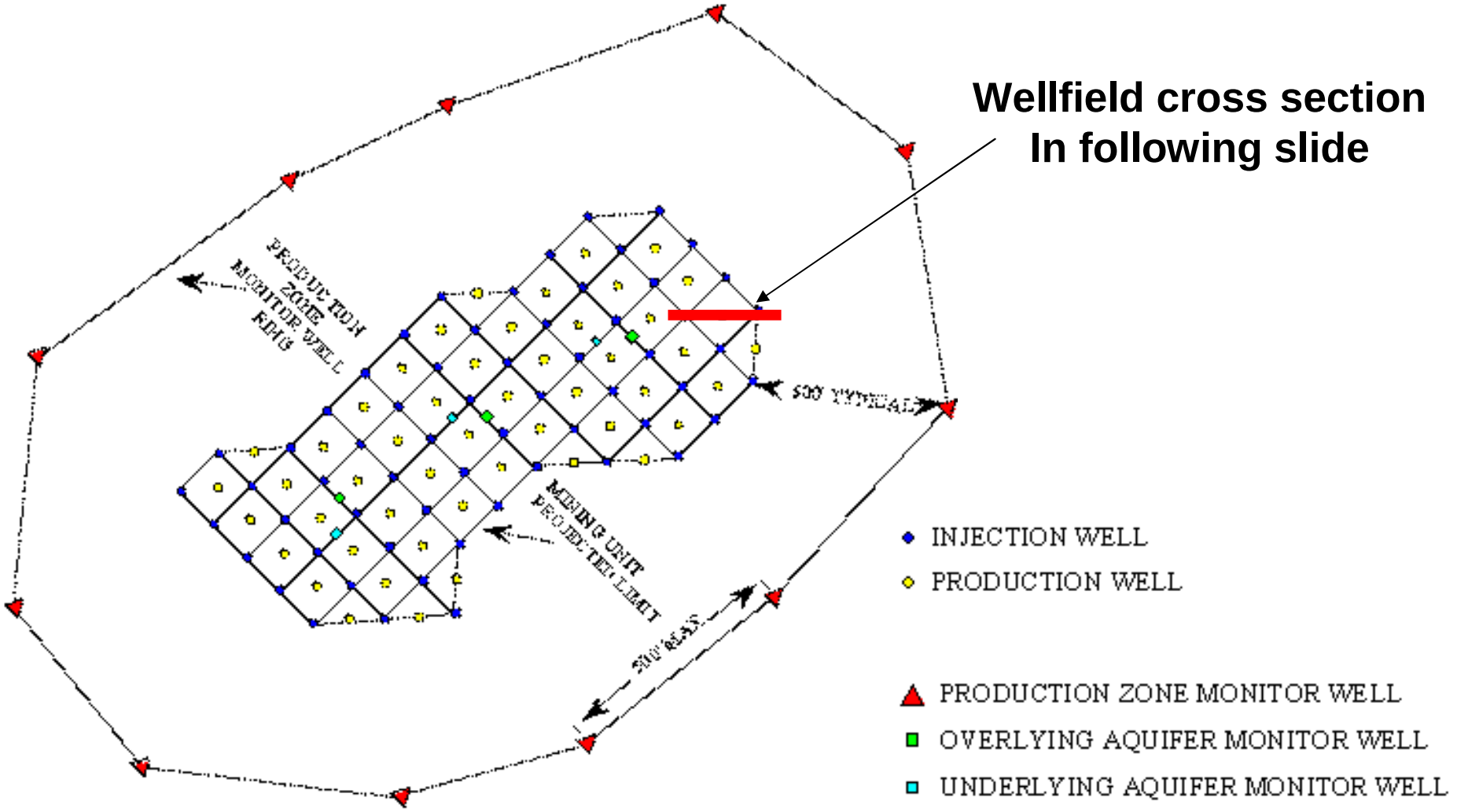
ISR Mine Production Schematic



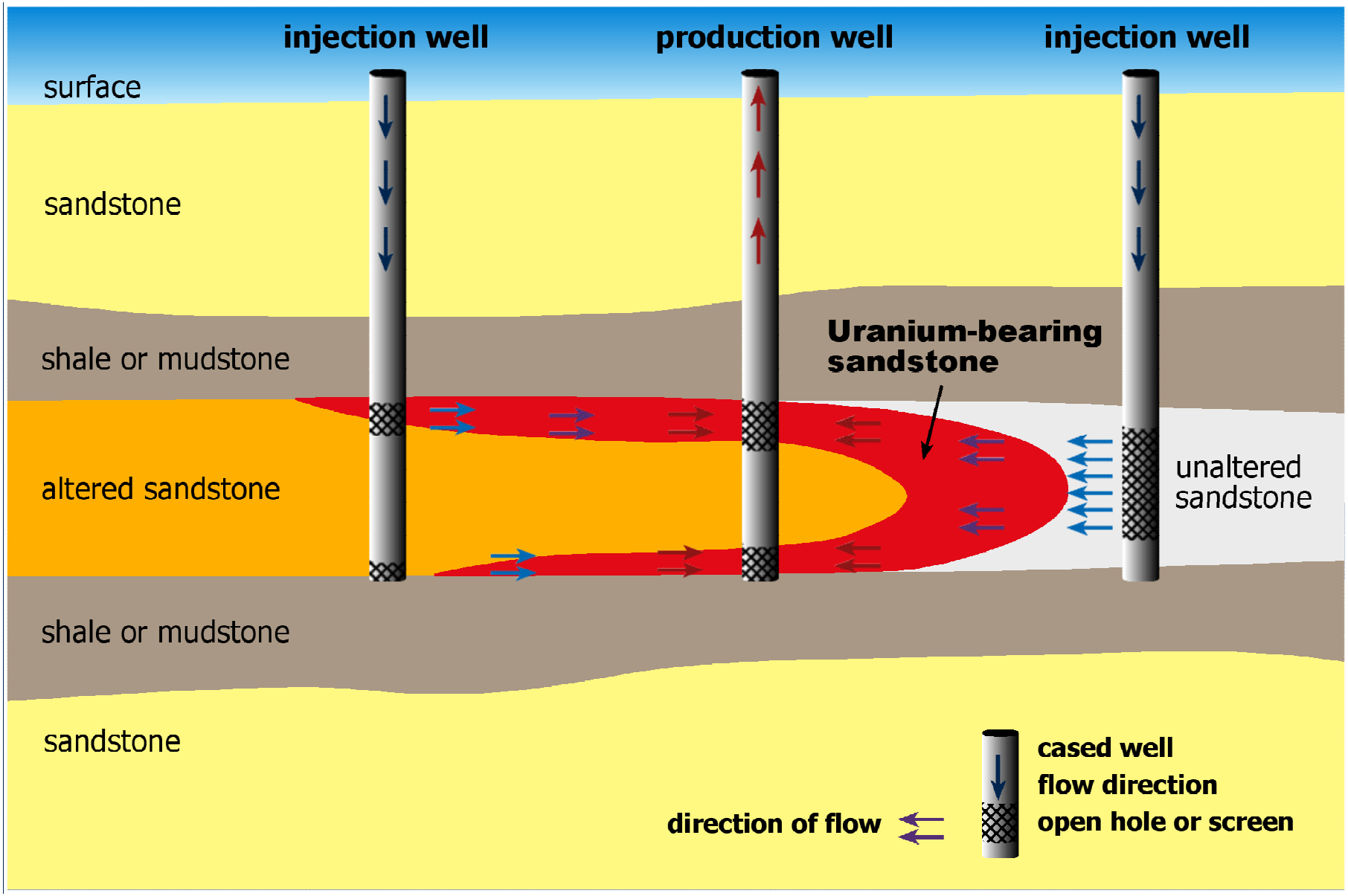
Basic ISR Process - Satellite



ISR Wellfield Layout



ISR Mining – Injection and Production Wells



Drilling to Install Wellfield

View at Christensen Ranch ISR Mine (Cogema/AREVA)
Powder River Basin, Wyoming

Photo by Tom Nicholson

ISR Wellfield Smith Ranch Mine (PRI/Cameco)
Powder River Basin, Wyoming

Photo by Bill Boberg – July 2005

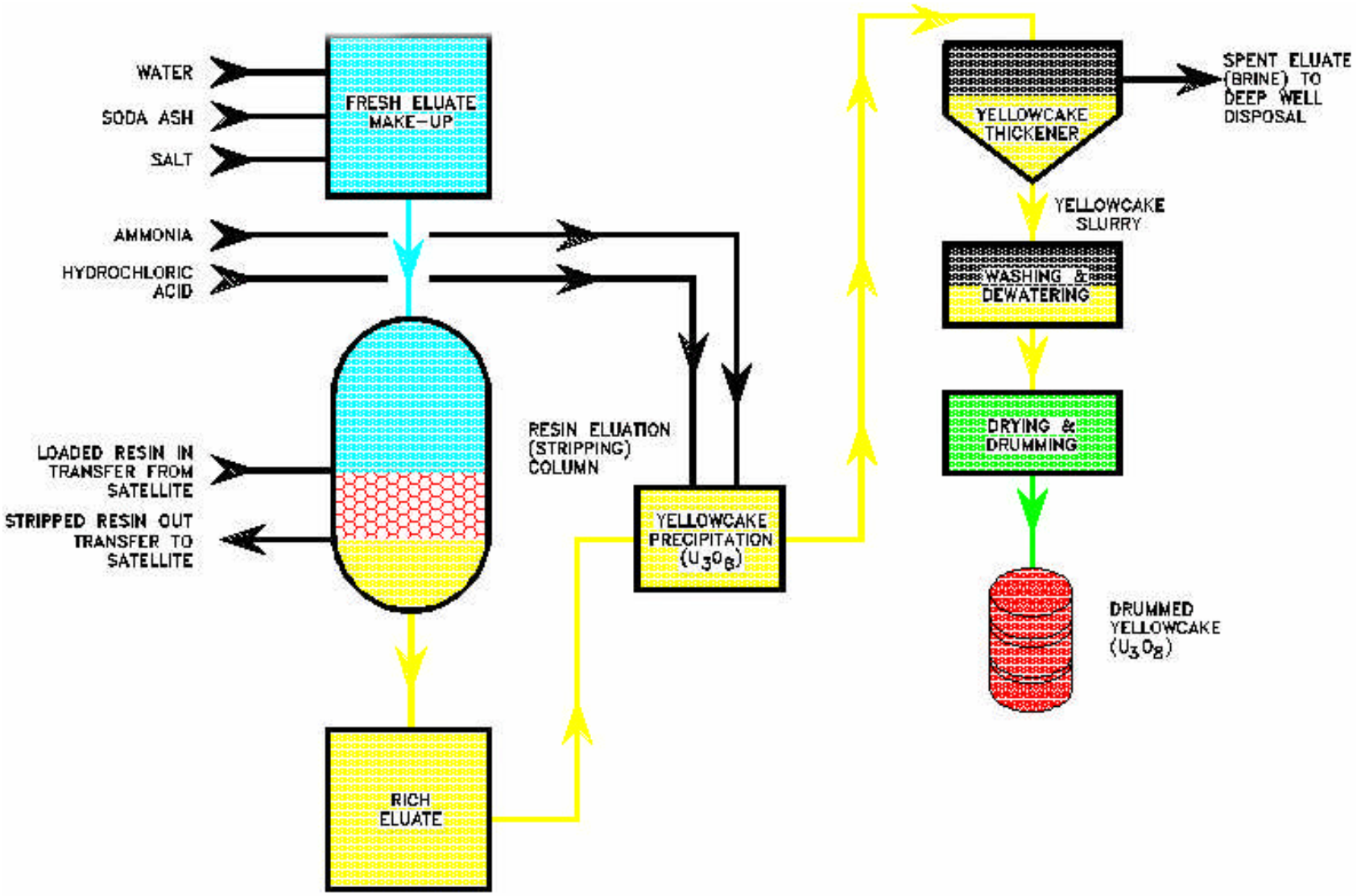
ISR Mining – A Plumbers World

Header House, controlling both injection as well as production from many wells in wellfield

A production well and insulating cover

Photos by Bill Boberg, Taken at PRI/Cameco Smith Ranch ISL Mine, Powder River Basin Wyoming – July 2005

Basic ISR Plant Processing



From the ISR Wellfield to the Plant

From the production well the produced fluid goes through resin tanks where the uranium is stripped from the fluid and is then returned to the wellfield

The resin is then transported to the mill where it is stripped and the uranium is taken into solution

Photos by Bill Boberg, Taken at PRI/Cameco Smith Ranch ISL Mine, Powder River Basin Wyoming – July 2005

From Solution to Yellowcake

After stripping from the resin, the uranium is taken through several steps in solution before being precipitated and dried

The final step in the mill is to package the dry yellowcake in drums

Photos by Bill Boberg, Taken at PRI/Cameco Smith Ranch ISL Mine, Powder River Basin Wyoming – July 2005

Yellowcake – The Product

Yellowcake
uranium oxide (U_3O_8)
800+ pounds per drum
US$80,000 per drum @ $100/lb

Filled drums of yellowcake awaiting shipment at Smith Ranch

Photos by Bill Boberg, Taken at PRI/Cameco Smith Ranch ISL Mine, Powder River Basin Wyoming – July 2005

ISR Mining
Ground Water Restoration