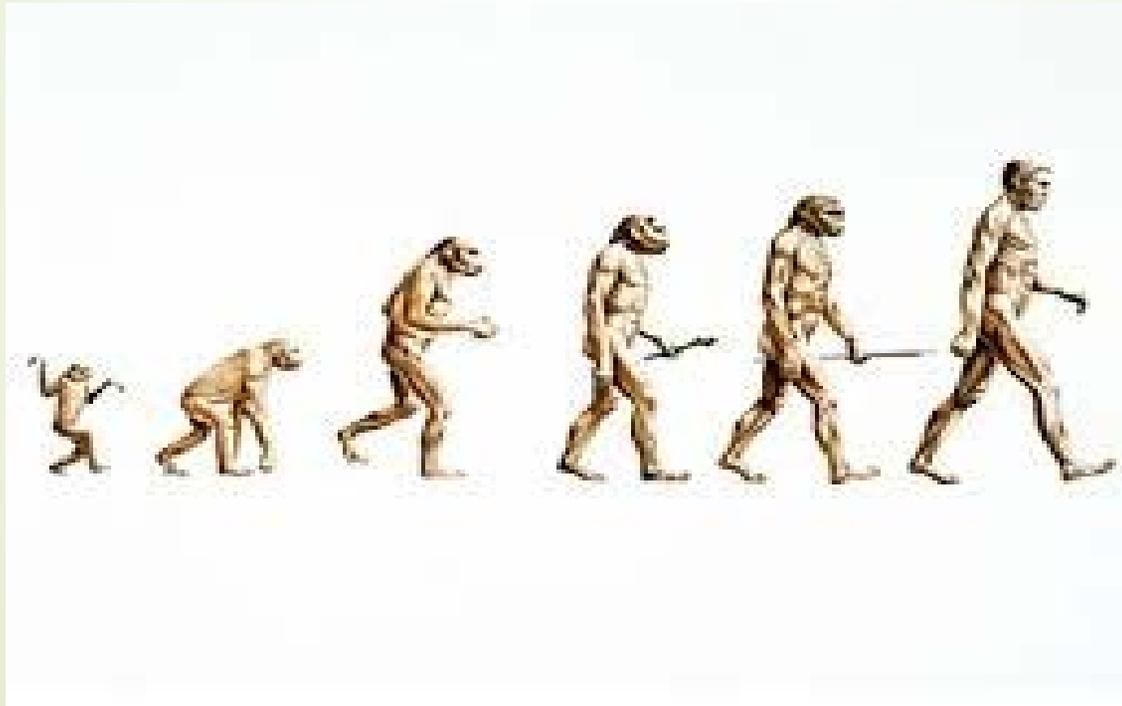


Archaeology of Evolution

Paradigm of a paradox

A Wyo-Ben, Inc. perspective of 5 projects (2010- 2019)



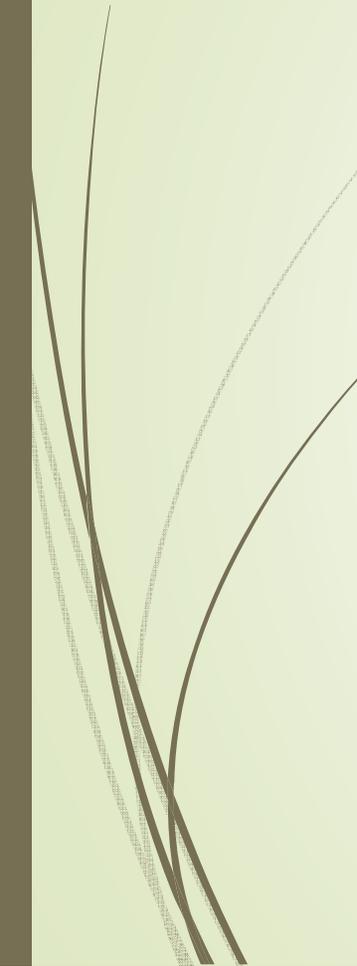
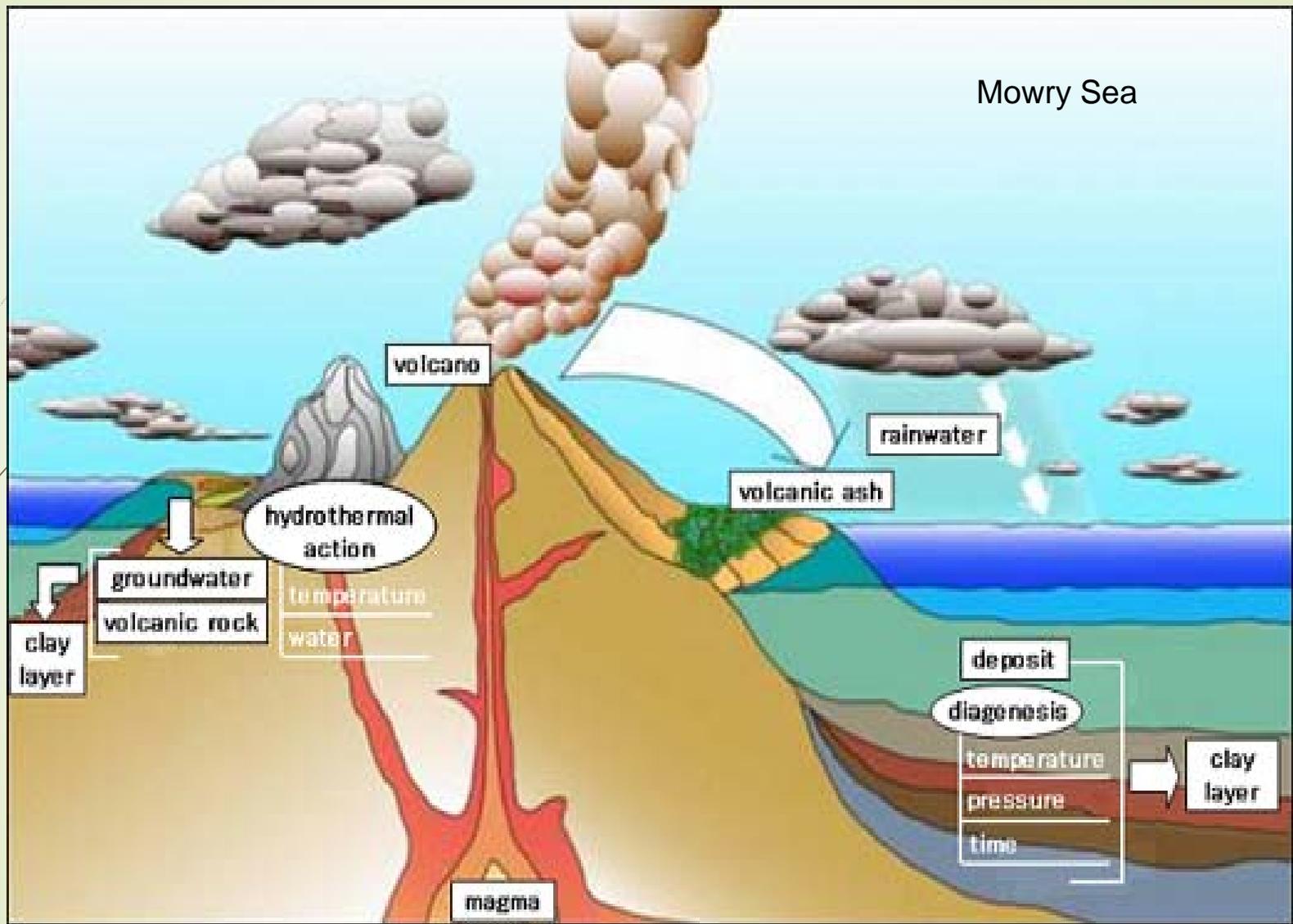


Wyoming Bentonite Source

- Middle Cretaceous (~85 – 115 Ma)
- Volcanic activity in east – central Idaho
- Each volcanic eruption created a new bentonite bed (14 – 16 commercial mineable beds)
- Formed when volcanic ash dissolved in Mowry Sea
- Bentonite precipitated from the “soup”

Fun Facts

- United States - #1 Producer of Bentonite
- Big Horn Basin – Supplies over 51%
- Sodium based Bentonite



1000+ Uses of Bentonite

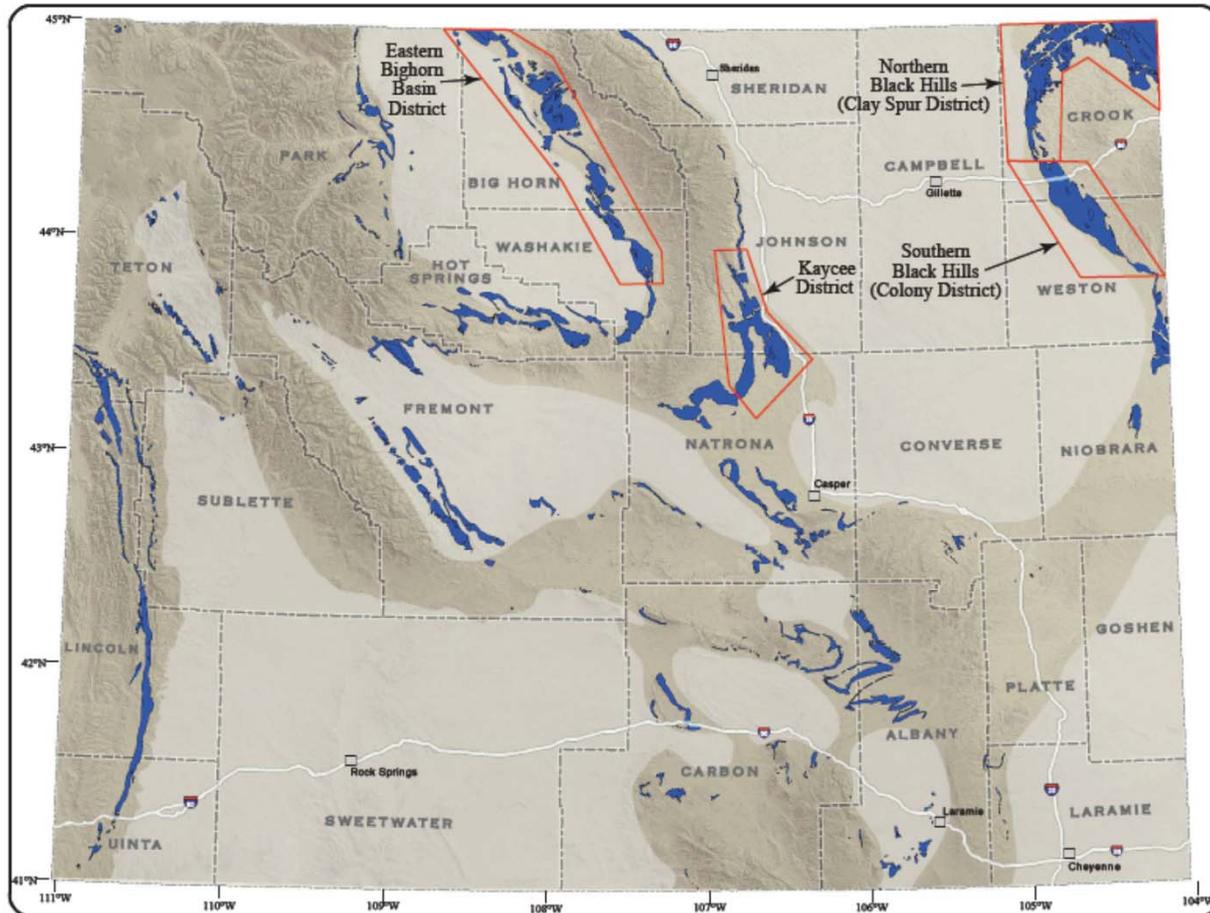
| | | | |
|--|--------------------------------|------------------------------------|--------------------------------------|
| Abrasive Wheels | Degreasing Agent (hides, wool) | Leather Treatments | Seed Disinfectants |
| Acid Neutralizer | Detergents | Linoleum Cement | Seed Inoculants |
| Animal Feed Supplements | Drilling Fluids | Masonry Cement | Sewage Treatment |
| Animal Litter | Dynamite | Matches | Sheep and Cattle Dip |
| Arc-welding | Electrical Insulation | Mechanic's Soap | Shoe Polish |
| Artificial Stone | Environmental sealants | Medical Emulsions | Sizing Agents |
| Asphalt Pavement | Face Cream | Metal Polishes | Slag Cements |
| Auto Polish | Facial Mud-packs | Nitro-starch Explosives | Soap |
| Bleaching Agent | Fertilizers | Ointments | Spark Plug Insulators |
| Brick Mortar | Fire Brick and Fire Clay | Oil-Based Paints | Stove Polish |
| Charcoal Briquettes | Fire Extinguisher Agents | Paper Manufacture (pitch sorption) | Stucco Plaster |
| Building Blocks | Foundry Sand Binder | Paper Coating | Taconite Iron Ore Pellerizing |
| Cardboard | Fruit Juice Clarifier | Paperboard | Tar (roofing) |
| Cement Tile | Fungicides | Plaster | Textile Printing Inks |
| Civil Engineering | Gelling Agents | Plaster Board | Thread-Cutting Compounds |
| Clarifying Agent (Wine, oils, vinegar) | Glauconitic Cements | Plastics | Tooth Paste |
| Clay Brick | Glues | Pottery | Varnish |
| Clay Tile | Graphite Crucibles | Printers Ink | Wall Sealing Agents |
| Clay Pipe | Horticultural Sprays | Putty | Water-Based Paints |
| Cleansing Agents | Irrigation Ditch Liners | Refining of Fats and Greases | Water Clarification Agents |
| Concrete | Insecticides | Roofing Paper | Water Color Paints |
| Crayons | Insulating Blocks and Boards | Rubber Compounds | Water-Proof Concrete |
| Crude Oil Cracking Catalyst | Laxatives | Rubbing Stones | Water-Proof Paper and Cardboard |
| Dam Cores | Lead Pencils | Scouring Soaps | Water Softeners |



WYOMING STATE GEOLOGICAL SURVEY
 Thomas A. Dreaan
 Director and State Geologist
 Laramie, Wyoming

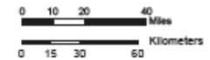


Geology - Interpreting the past - Providing for the future



EXPLANATION

- Bentonite-bearing Strata
 Cretaceous formations included:
 Mowry, Thermopolis, Belle Fourche,
 Hilliard shale, Aspen shale,
 Newcastle sandstone, Frontier,
 parts of Cody and Steele shales
- Bentonite district boundaries
- City or town
- Interstate highway
- County boundary



Map design by Phyllis Ranz, layout by James Rodgers 9/2014.

Wyoming Bentonite

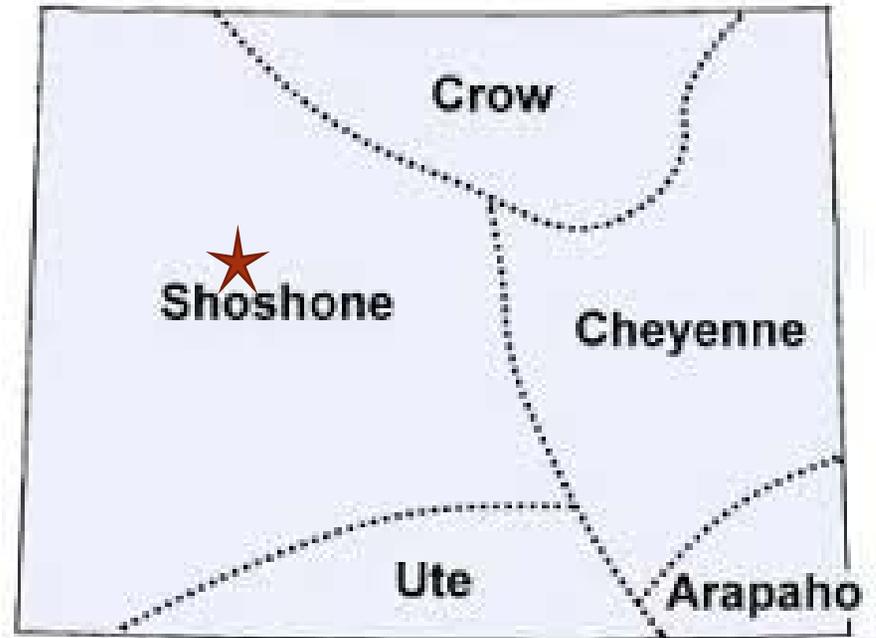


Wyo-Ben Typical Mining

- Open Cut Mining
- Shallow to moderately dipping beds along Anticline and Synclines
- Frontier, Mowry, & Thermopolis Shale Formations (14 - 16 beds)
- Project Disturbance Boundary 400 - 600 Acres
- Width of mine 100 - 200 feet
- Cast Back Mining Technique
- Transitory Mining (2 - 5 years)
- Maximum highwall of 10:1

Historic Wyoming Native American Territories

Wind River Reservation Eastern Shoshone & Northern Arapaho





6 Areas of Regulatory Creep (2010 – 2019)

- **Definition of Direct APE**
- Definition of Indirect APE
- Compensatory Mitigation
- Tribal Involvement
- Annual Monitoring
- Construction Monitoring

Direct APE (Class III Survey)

- ▶ Disturbance Boundary (Footprint Pre-2010)
(Ex. 5,280 feet by 200 ft wide = 24.24 AC)
- ▶ *Disturbance Boundary plus 100 foot
(Ex. 5,280 feet by 200 ft w/ 100 ft buffer = 50.32 AC)

More than DOUBLES the Acres required to be surveyed

* This is now considered the "Standard Direct APE"

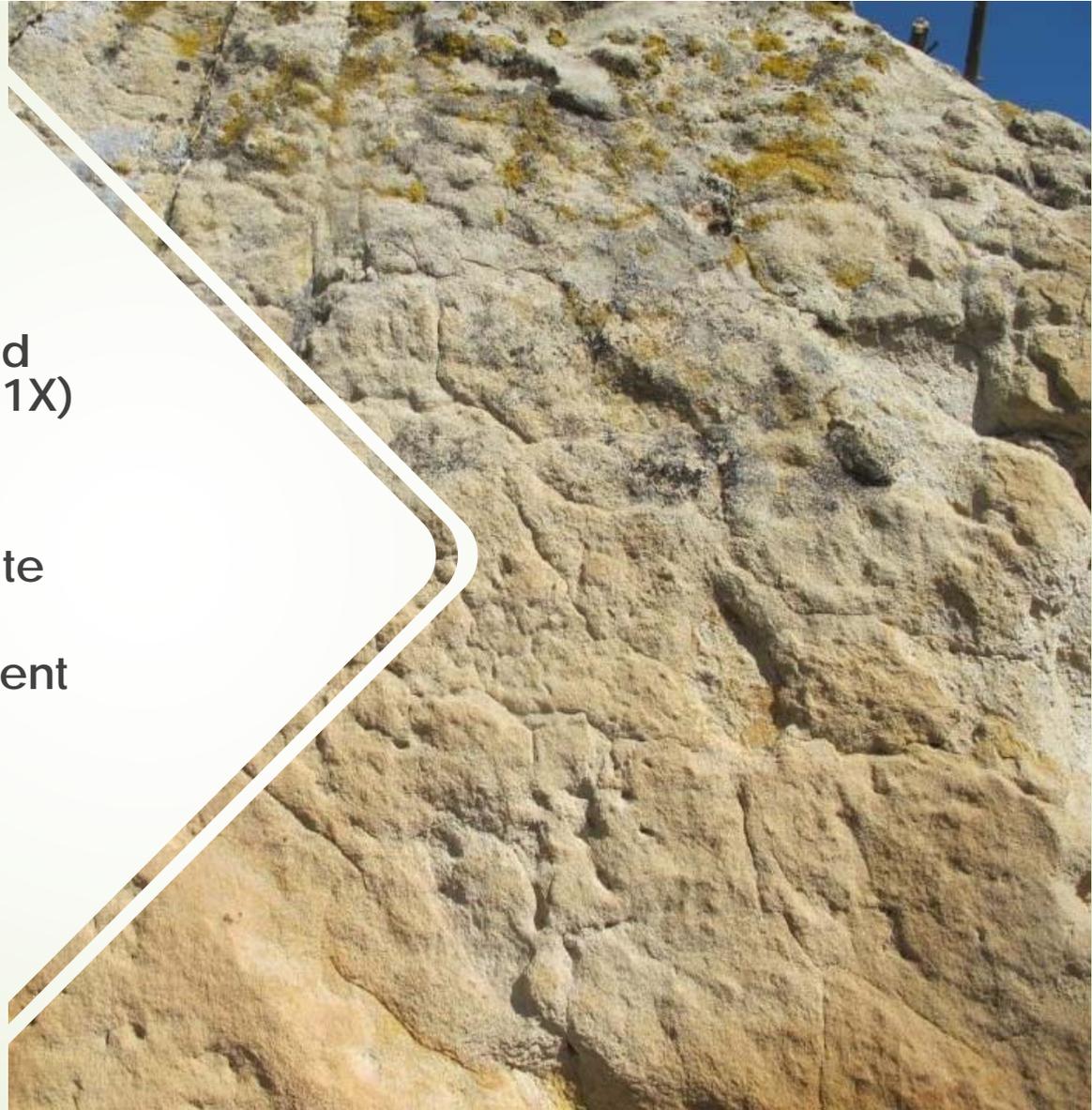


Areas of Regulatory Creep (2010 – 2019)

- Definition of Direct APE
- **Definition of Indirect APE**
- Compensatory Mitigation
- Tribal Involvement
- Annual Monitoring
- Construction Monitoring

Project 1 – Indirect APE (2012 – 523.9 Acres)

- *New Contractor (#2) Fall 2010*
- Up to 3 miles within the viewshed Class II Survey (32,000 acres – 61X)
- 3 visits with BLM Field Office for clarification
- A single unconfirmed rock art site within ½ mile from Direct APE
- 3 trips by Contractor #2 at different times – no rock art
- “There may be more surveys required based on what is discovered in the original Class III report”





Project 2 – Indirect APE (2010 – 500.4 Acres)

- ▶ Up to 3 miles within the viewshed
(15,650 ac – 31X)
- ▶ Class II Survey
 - ▶ Contractor #1 submits Class III Report
January 2011
 - ▶ Receives NOV – lack of Class II Report April 2011
 - ▶ Contractor #1 completes Class II field work
May – July 2011
 - ▶ Submits Final Report (Class II & III) September
2011
- ▶ ***NO DIRECT IMPACT***
- ▶ WB agrees to Voluntary Timing Restrictions
for Tribal Access & Solitude
- ▶ Programmatic Agreement (Visual & Dust)
 - ▶ Annual Training WB Employees/Contractor
 - ▶ Annual monitoring
 - ▶ Photogrammetry
 - ▶ National Register
 - ▶ Public Benefit – Education pamphlet
- ▶ Project Approved (EA) October 2012



Project 3 – Indirect APE (2012 – 535.2 Acres)

- ▶ APE 1 = Class III Survey (Single Area - 2011)
- ▶ APE 2 = Class III Survey (Consolidation - 2012)
- ▶ APE 3 = Class III Survey (Small Revision – 2013)
- ▶ Plan of Operation Technically Complete
 - ▶ NEPA Review begins March 2014
- ▶ April 2014 Wyo-Ben notified
 - ▶ “New Discovery” in the Viewshed
 - ▶ Class II APE identified (22,200 acres – 41X)
- ▶ Wyo-Ben compensates for Tribal Tours (4)
- ▶ Memorandum Of Agreement (MOA)
 - ▶ Avoidance Buffers around rock features – 100 feet
 - ▶ Tribal monitoring within 100 – 200 foot of features
 - ▶ Hire an artist to sketch the Rock Art Panels
- ▶ Project Approved (EA) November 2015



Project 4 – Indirect APE (2014 – 369.1 Acres)

- Up to 3 miles within the viewshed (30,700 Acres – 83X)
- Discovery of a Single Site
 - Multiple Rock Features (Cairns & Alter)
 - Rock Structure (Eagle Trap or lookout)
- Modify Mine plan to avoid Direct Effects
- Memorandum of Agreement (Indirect)
 - Additional photo documentation
 - Plan views of the site
 - Measurements of certain non-cairn features
 - Additional Viewshed Photographs
 - Public Benefit - Ethnography Study
- Side Comments:
 - Site is within 0.25 miles of a US HWY
 - WYDOT traffic count 3,600+ per day

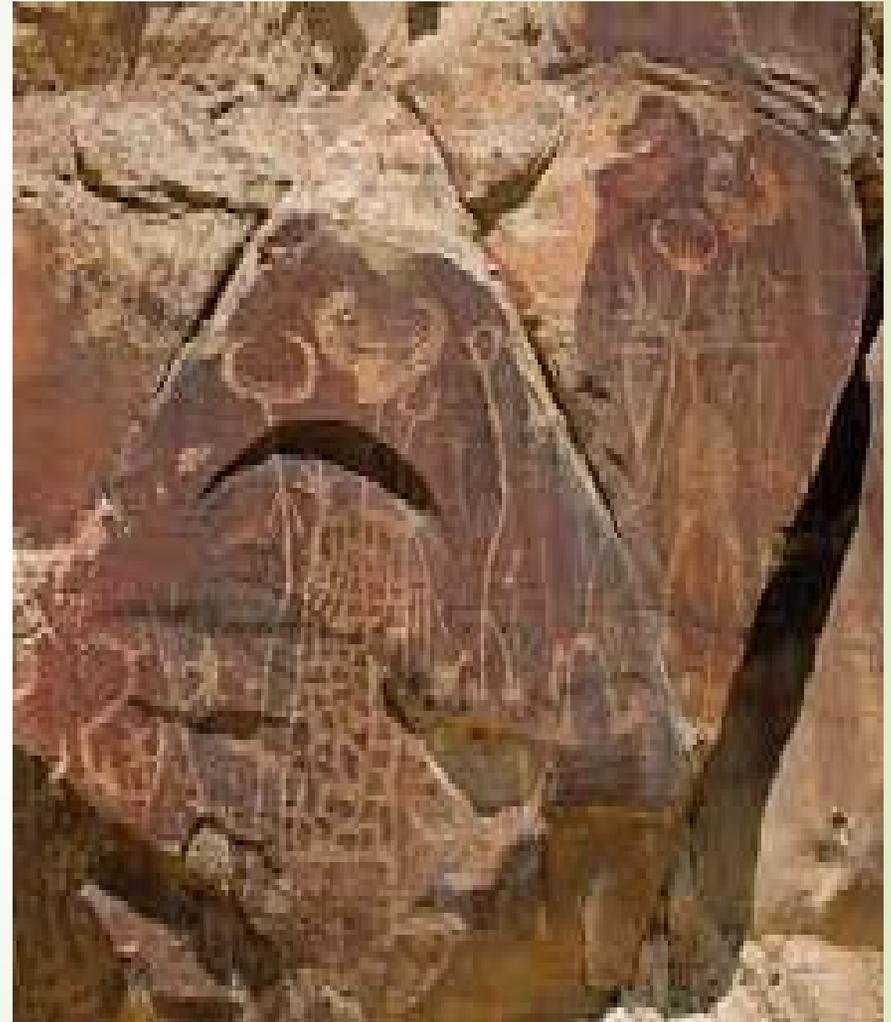
Project 5 – Indirect APE (2014 – 567.3 Acres)

- ▶ Initial - 3 mile viewshed
(41,924 Acres – 73X)
- ▶ WB requests meeting with State BLM
& SHPO 7/26/2013
- ▶ Tour with State BLM, SHPO, & local BLM
Field Office Personnel 9/9/2014
- ▶ Redefined Indirect Area Class II
(9,800 Acres – 17X)
 - ▶ Rock Features/Rock Art
 - ▶ Targeted geologic features
 - ▶ Targeted slopes
- ▶ Compensate Tribal Tours - Expedite
- ▶ Visiting tribe have asked how another
tribe interprets this area



Project 5 – Indirect APE (2014 – 567.3 Acres) (cont.)

- ▶ Memorandum of Agreement begins 6/11/2018
 - ▶ WB agrees to Avoid all of the direct eligible resources within Direct APE
 - ▶ In the PoO we have 26 measures to Avoid, Minimize and Mitigate our impact
 - ▶ WB agrees to Voluntary Timing Restrictions for Tribal Access & Solitude
 - ▶ Training Personnel & Contractor
 - ▶ Dust Mitigation
 - ▶ Speed Limits
 - ▶ *Compensatory Mitigation – Public Benefit based on the “Spirit” of the Rules & Regulations*
 - ▶ *Construction Monitoring for 7 polygons*
 - ▶ *Annual Field monitoring*
 - ▶ Standard Discovery (Stop, Call, Lock Down, Wait)





Areas of Regulatory Creep (2010 – 2019)

- Definition of Direct APE
- Definition of Indirect APE
- **Compensatory Mitigation**
- Tribal Involvement
- Annual Monitoring
- Construction Monitoring



Compensatory Mitigation

- Is there a requirement of Compensatory Mitigation for Indirect impacts?
- Prior Compensatory Mitigation
 - Photogrammetry
 - Annual Monitoring of 7 sites
 - Hired an Artist to record the rock art panels
 - Additional photo documentation
 - Plan views of the site
 - Measurements of certain non-cairn features
 - Additional Viewshed Photographs
 - Ethnography Study



Areas of Regulatory Creep (2010 – 2019)

- Definition of Direct APE
- Definition of Indirect APE
- Compensatory Mitigation
- **Tribal Involvement**
- Annual Monitoring
- Construction Monitoring



Tribal Involvement

- ▶ The Tribes are becoming more engaged
- ▶ Asking questions -What do other tribes think?
- ▶ Want to do their own Class III Surveys
- ▶ Asking questions - How many Natives were part of the Class III?
- ▶ Visitation to the Project Areas
- ▶ Participate in determining eligibility of sites
- ▶ Requesting Traditional Cultural Specialist Monitoring (prior Tribal Monitors)



Do over or Mulligan

What we have learned or what we would change?

- ▶ **Plan Ahead (Years)**
 - ▶ Identify the areas of disturbance (More is Better)
 - ▶ Request a Pre-Planning meeting
 - ▶ Have the Agency define the APE (Direct & Indirect)
- ▶ **Justify the APE**
- ▶ **Ask Questions**
- ▶ **Think twice about compensation**
 - ▶ BLM has a Good Faith Effort (1780 Manual)
- ▶ **Hire competent Contractors**
- ▶ **BE AWARE** – What is a “voluntary” measure today may become a standard tomorrow.

Takeaways

- ▶ 1. Challenge expansions of APE (indirect especially – early)
 - ▶ Consultation with lead agency (BLM) who has authority to determine
 - ▶ If indirect APE are being expanded on basis of VRM – determine early if “setting” is a vital part of the “integrity” of the area for listing
- ▶ 2. Challenge and disagree with a finding of adverse effect (especially to setting)
 - ▶ Be active consulting party in determining the characteristics of a property that qualify it for inclusion
 - ▶ Be active consulting party in disagreeing with findings of adverse effect – especially when those implicate visual / setting as it expands current and future need for indirect APE
- ▶ 3. Know your limitations on mitigation
 - ▶ Be prepared with a plan on how to avoid / minimize / mitigate any adverse effect
 - ▶ Do not freely volunteer compensatory mitigation – use voluntary compensatory mitigation as a tool
 - ▶ Be willing to challenge the applicability of compensatory mitigation to the adverse effect to the characteristic of the property
- ▶ 4. Be or Get Active
 - ▶ Drafting of the PA, be willing to consult and be an active party
 - ▶ Be aware of the state protocols and the potential effects to you and your projects in the future
- ▶ 5. **KNOW THE PROCESS** – do not assume that subsuming into NEPA or coordination within NEPA will be a simple fix to problems arising under Section 106.



Questions?

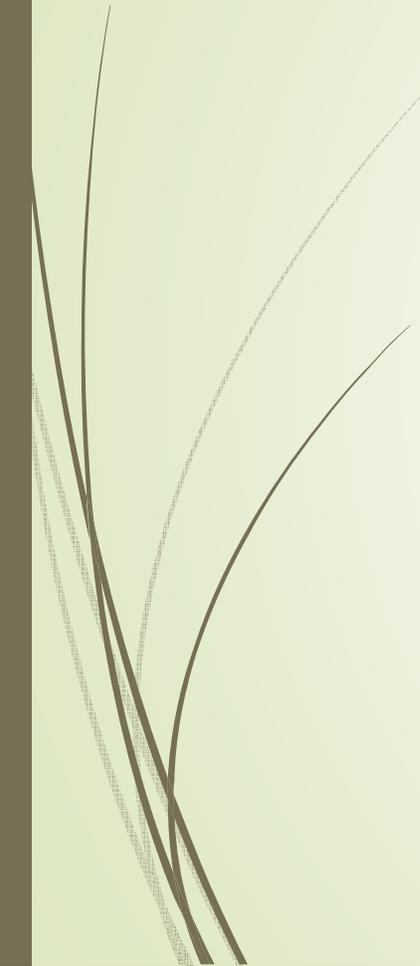


Areas of Regulatory Creep (2010 – 2019)

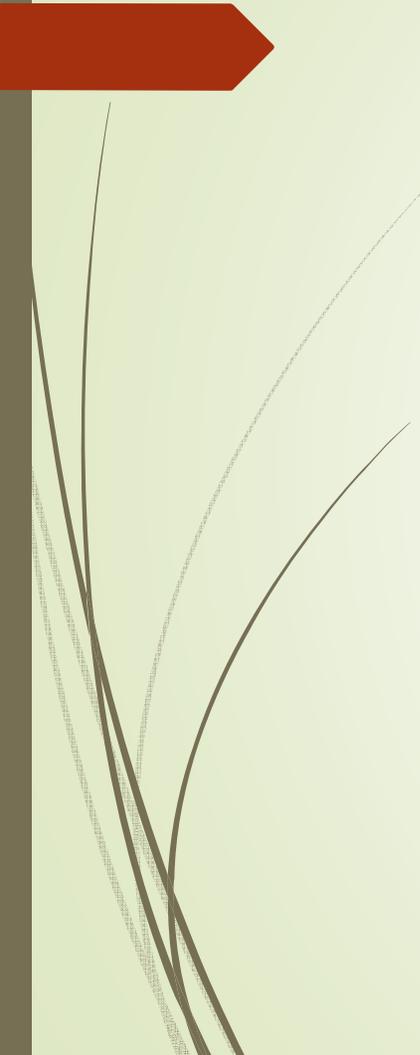
- Definition of Direct APE
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- **Annual Monitoring**
- Construction Monitoring



Annual Monitoring







| Disturbance Area (acres) | Direct APE Area w/100' buffer (sq.. mi) | 1/4 mile Indirect APE Area (sq. mi) | 3 mile Indirect APE area (sq. mi) |
|-----------------------------|---|--|--------------------------------------|
| 1 | 0.006 | 0.327 | 36.93 |
| 10 | 0.027 | 0.413 | 37.95 |
| 100 | 0.188 | 0.683 | 41.20 |
| 500 | 0.850 | 1.172 | 47.06 |
| 1000 | 1.659 | 1.538 | 51.45 |