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# **SODIUM AND POTASSIUM VALUATION**

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# *Solid Minerals & Geothermal CAM*

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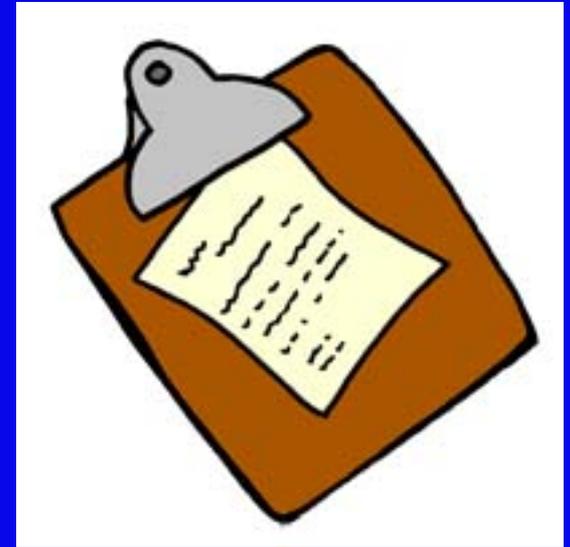
# *COURSE OUTLINE*

- **Royalty Revenues**
- **Nature of sodium/potassium minerals**
  - geology
  - chemistry
- **Mining methods**
- **Processing**
- **Products**

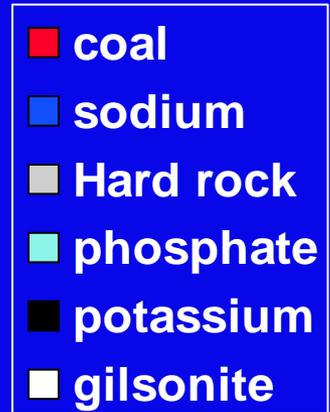
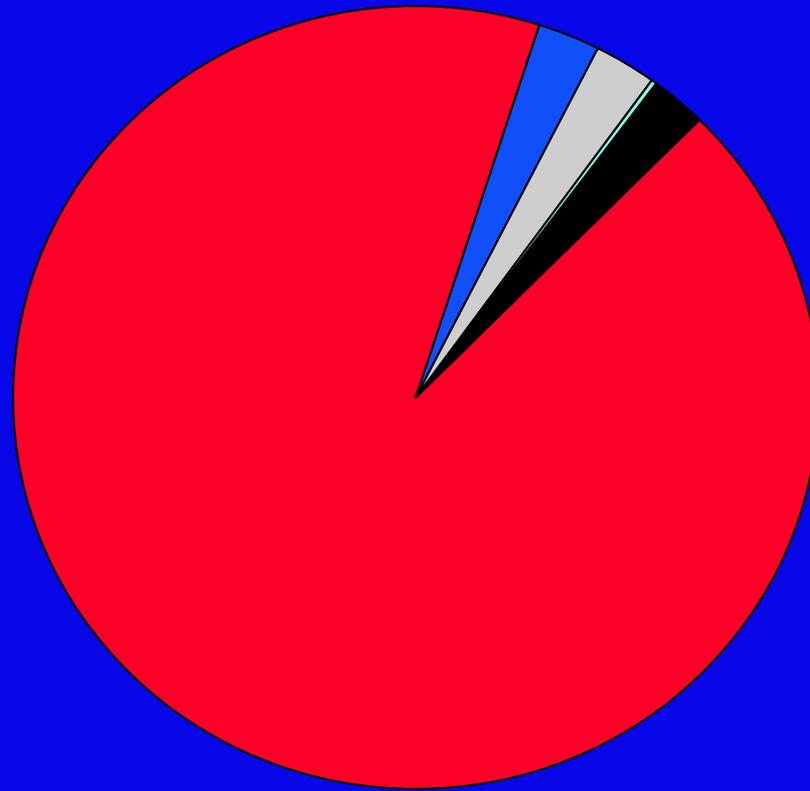


# *COURSE OUTLINE (CONT.)*

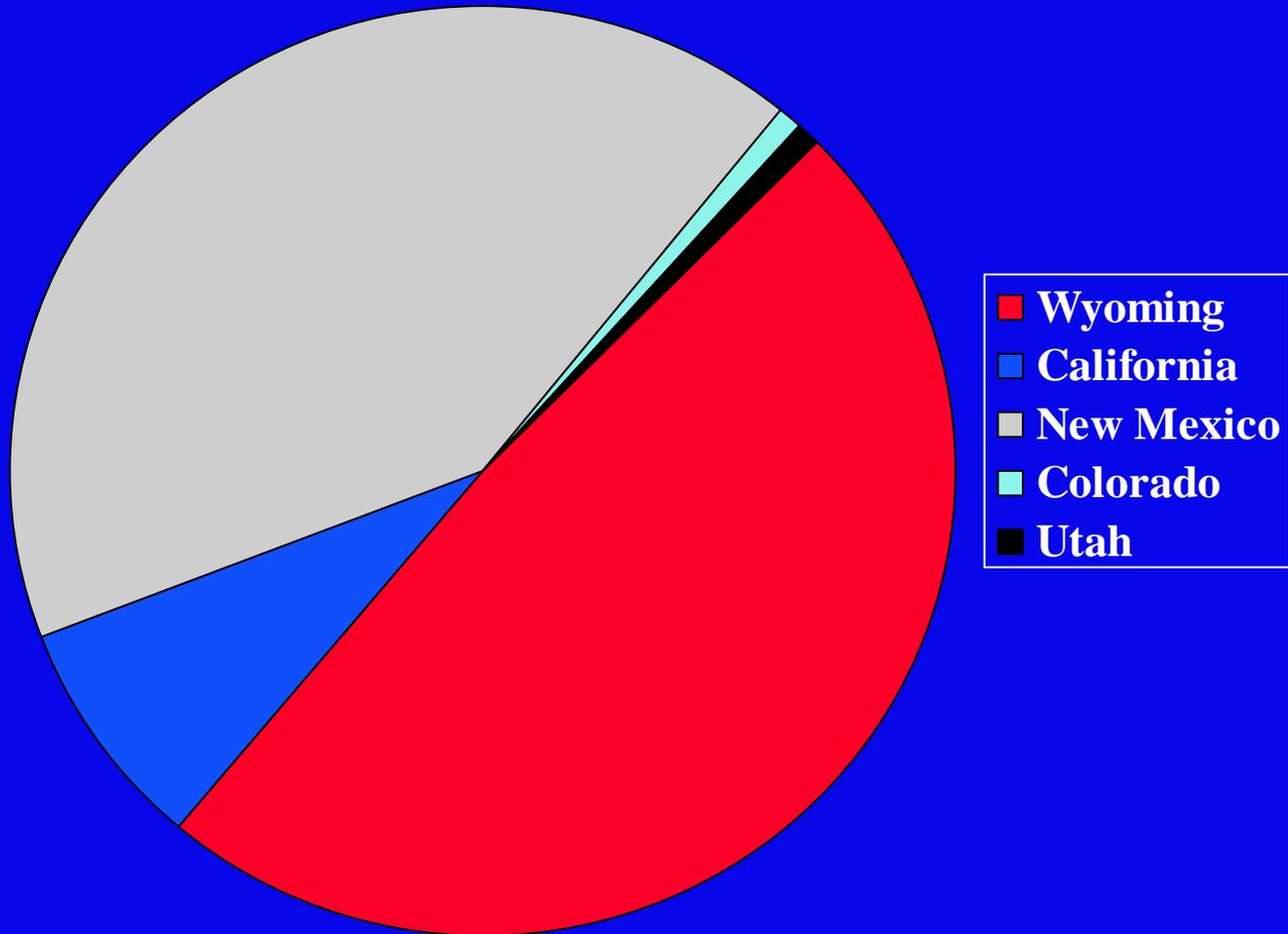
- **Producing Regions**
- **Statutory Authority**
- **Regulatory Authority**
- **Lease Terms**
- **Guidelines**
- **Valuation Principles**
- **Important Court and IBLA Decisions**
- **Summation and Rules of Thumb**



# *SOLID MINERAL ROYALTIES BY PRODUCT TYPE--2007*

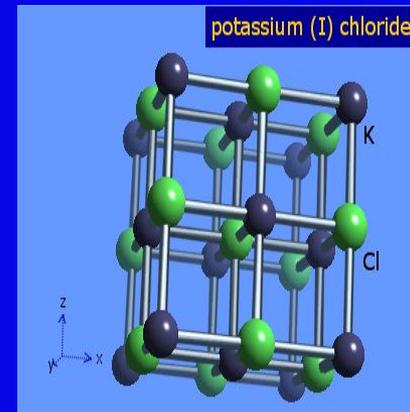
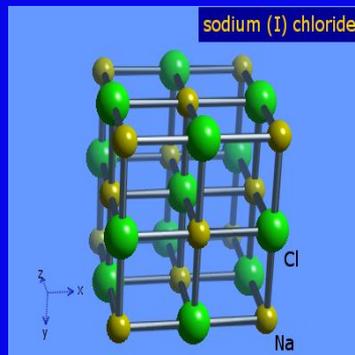
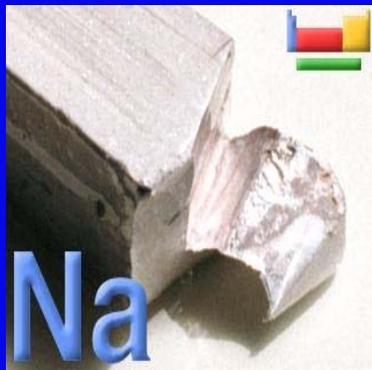
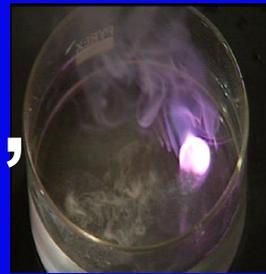


# SODIUM AND POTASSIUM ROYALTIES BY STATE--2007



# SODIUM AND POTASSIUM COMPOUNDS

- Sodium/Potassium not found alone.
- Very reactive
- Always with other elements
- Chlorites, sulfates, carbonates, borates, silicates, nitrates.



# *GEOLOGY*

- Deposited in salty lakes and shallow seas
- Chemicals in the water are concentrated through evaporation
- Evaporite minerals
- Also called saline minerals or salts

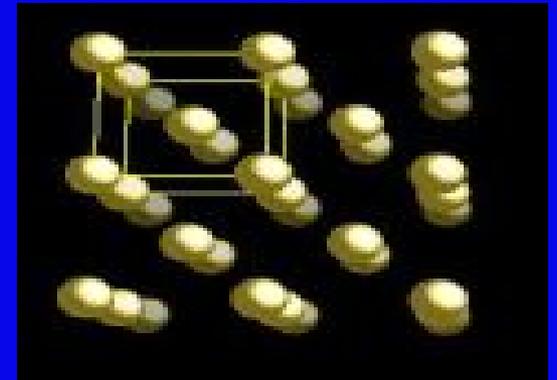
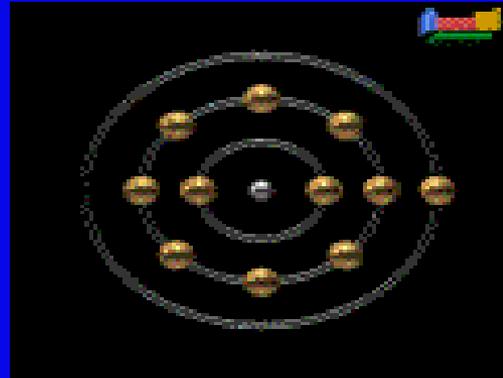
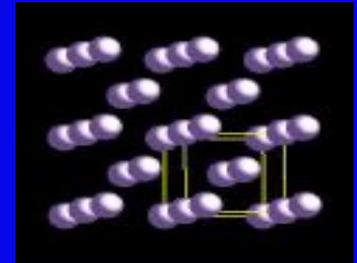


# CHEMISTRY

## *Symbols for elements*

- potassium--K
- sodium--Na
- lithium--Li
- magnesium--Mg

- chlorine--Cl
- Sulfur--S
- Carbon--C
- Boron--B
- silicon--Si



# CHEMISTRY

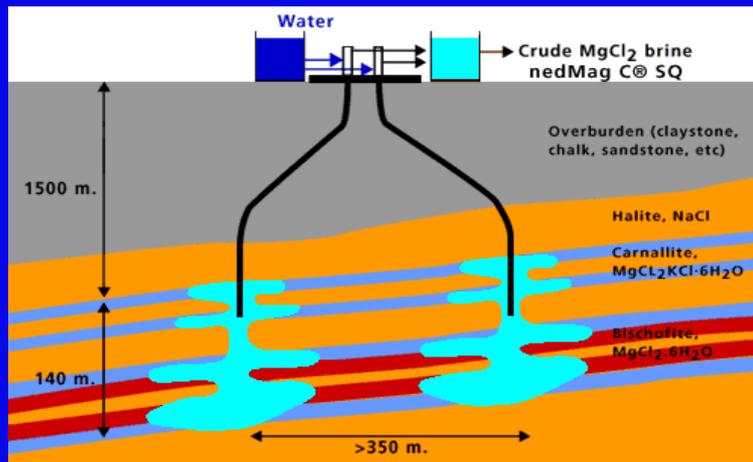
## *Symbols for compounds*

- $\text{NaCl}$ --table salt, halite
- $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ --borax
- $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$ —trona
- $\text{NaHCO}_3$ --Nahcolite
- $\text{KCl}$ --Sylvite, potash
- $\text{K}_2\text{SO}_4 \cdot 2\text{MgSO}_4$ -- Langbeinite
- $\text{K}_2\text{SO}_4$ — potassium sulfate



# MINING METHODS

- Solid
- Solution
- Brine



# *PROCESSING*

## *Physical*

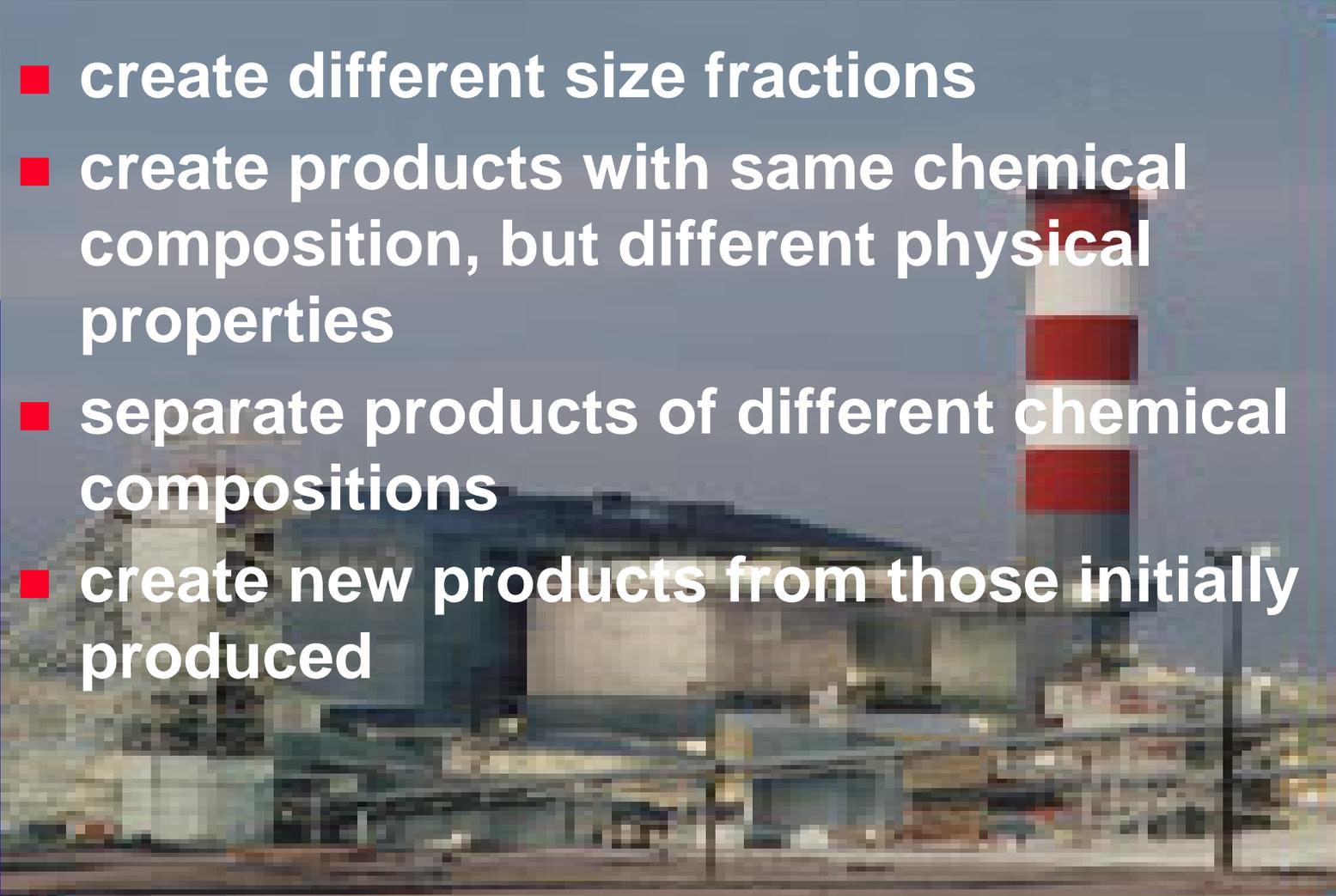
- **crush**
- **dry**
- **size**
- **remove impurities**
- **concentrate**



# *PROCESSING*

## *Chemical*

- create different size fractions
- create products with same chemical composition, but different physical properties
- separate products of different chemical compositions
- create new products from those initially produced



# PRODUCTS

- The raw ore and brine
- Naturally occurring components of the ore and brine
- Incompletely processed products
- Refined products
- Associated and related minerals



# *PRODUCTS*

## *Terminology*

- **The products produced are termed as:**
- **Primary**
- **Secondary**
- **Tertiary**

# *PRODUCTS*

## *Primary*

- **Primary products include those products which are naturally occurring components of the ore or brine.**
- **Primary products are the first marketable products produced from processing the raw ore or brine without adding chemicals.**
- **Incompletely processed and refined products.**

# *PRODUCTS*

## *Reagents*

- Reagent is defined as a chemical (or a component of a chemical) used in processing ore.



# *PRODUCTS*

## *Reagents*

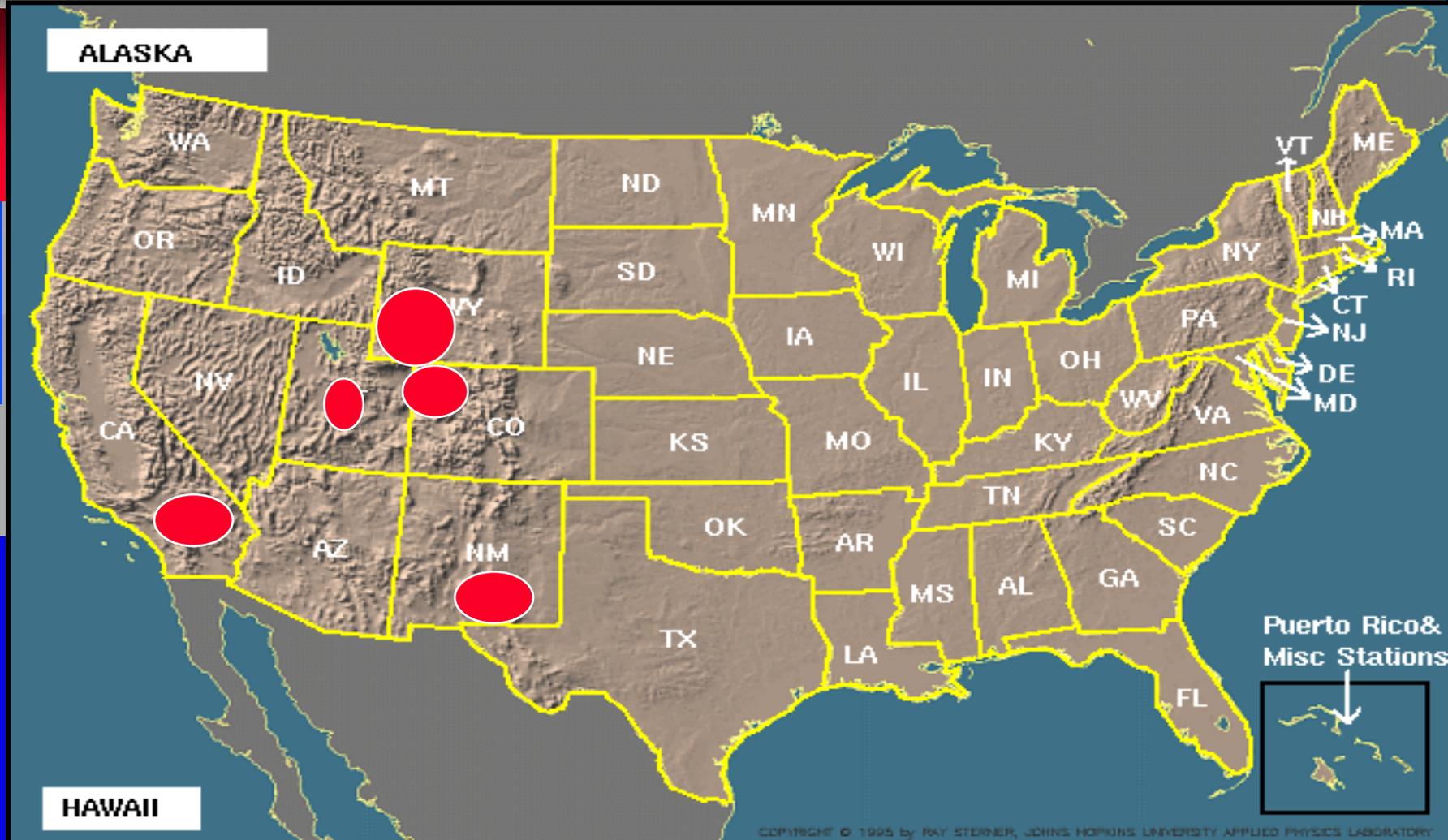
- If the product you produced first from your ore contains a reagent that first marketable product is a secondary product.
- The valuation of a first marketable secondary product differs from the valuation of other secondary products.

# *PRODUCTS*

## *Secondary*

- When a primary product undergoes chemical processing and is used to make another saleable compound, the result is a secondary product.
- If a secondary product is consumed to make another saleable compound, the result is a tertiary product.

# MAIN PRODUCING REGIONS



# MAIN PRODUCING REGIONS

## *Piceance Basin, NW CO-Products*

- Ore mineral nahcolite,  $\text{NaHCO}_3$
- Sodium bicarbonate,  $\text{NaHCO}_3$
- Soda ash,  $\text{Na}_2\text{CO}_3$
- Carbon dioxide,  $\text{CO}_2$



# MAIN PRODUCING REGIONS

## *Green River, SW WY--Products*

- Crude trona (alkaten), primary  
 $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$
- Sodium sesquicarbonate, primary  
 $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$
- Sodium carbonate (soda ash), primary,  
 $\text{Na}_2\text{CO}_3$ 
  - light
  - dense

# *MAIN PRODUCING REGIONS*

## *Green River--Products (cont.)*

- Sodium bicarbonate, secondary,  $\text{NaHCO}_3$
- Sodium tripolyphosphate (STP), secondary  $\text{Na}_5\text{P}_3\text{O}_{10}$
- Tetrasodium pyrophosphate (TSP), secondary  $\text{Na}_4\text{P}_2\text{O}_7$
- Sodium hydroxide, secondary,  $\text{NaOH}$

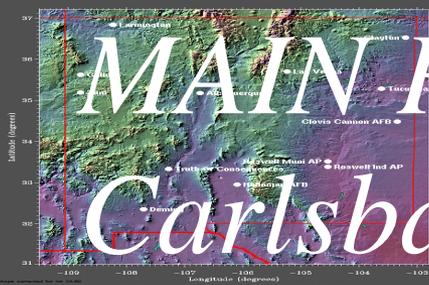


# MAIN PRODUCING REGIONS

## *Green River--Products (cont.)*

- Sodium sulfite, secondary,  $\text{Na}_2\text{SO}_3$
- Sodium cyanide, tertiary,  $\text{NaCN}$
- Purge liquor, primary
- Mine water, primary





# MAIN PRODUCING REGIONS

## *Carlsbad area, SE NM--Products*

- Ore minerals and products:
  - halite, NaCl (salt)
  - sylvite, KCl (potash)
  - langbeinite,  $K_2SO_4 \cdot 2MgSO_4$



# *MAIN PRODUCING REGIONS*

## *Carlsbad--Products (cont.)*

- **Potassium sulfate, primary,  $K_2SO_4$**
- **Potash (potassium muriate)**
  - **chemical**
  - **industrial**
  - **soluble**
  - **standard**
  - **fine**
  - **coarse**
  - **granular**





# MAIN PRODUCING REGIONS

## Great Salt Lake, Utah--Products

- Brines contain potassium, sodium, and magnesium
- Potassium chloride (potassium muriate), primary,  $KCl$
- Potassium sulfate (sulfate of potash), primary,  $K_2SO_4$



# *MAIN PRODUCING REGIONS*

## *Great Salt Lake--Products (cont.)*

- Sodium chloride, primary, NaCl
- Sodium sulfate, primary, Na<sub>2</sub>SO<sub>4</sub>
- Magnesium chloride brine, primary, MgCl<sub>2</sub> in water



# MAIN PRODUCING REGIONS

## Searles Lake, S CA--Products

- Ore minerals:

- trona,  $\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$

- borax,  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$

- halite,  $\text{NaCl}$

- hanksite,  $9\text{Na}_2\text{SO}_4 \cdot 2\text{Na}_2\text{CO}_3 \cdot \text{KCl}$

- nahcolite,  $\text{NaHCO}_3$



# *MAIN PRODUCING REGIONS*

## *Searles Lake--Products (cont.)*

- **Crude trona, primary**
- **Sodium chloride, primary, NaCl**
- **Sodium carbonate (soda ash), primary, Na<sub>2</sub>CO<sub>3</sub>**
- **Sodium bicarbonate, primary, NaHCO<sub>3</sub>**
- **Sodium sulfate (salt cake), primary and secondary, Na<sub>2</sub>SO<sub>4</sub>**

# *MAIN PRODUCING REGIONS*

## *Searles Lake--Products (cont.)*

- Borax, primary,  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$ , (deca)
- Borax, primary,  $\text{Na}_2\text{B}_4\text{O}_7 \cdot 5\text{H}_2\text{O}$ , (penta)
- Boric acid, secondary,  $\text{H}_3\text{BO}_3$
- Anhydrous borax, (pyrobor), secondary,  $\text{Na}_2\text{B}_4\text{O}_7$
- Boric oxide, secondary,  $\text{B}_2\text{O}_3$

# *STATUTORY AUTHORITY*

- **Congress**



# *STATUTORY AUTHORITY*

## *Sodium and potassium*

- **Sodium is a leasable “mineral” covered by the Mineral Leasing Act of 1920.**
- **Potassium is a leasable “mineral” covered by the Potassium Act of 1927.**



# *STATUTORY AUTHORITY*

## *Sodium--30 USC § 261-263*

- “chlorides, sulphates, carbonates, borates, silicates, or nitrates of sodium”
- “royalty of not less than 2 per centum of the quantity of gross value of the output of sodium compounds and other related products at the point of shipment to market”



# *STATUTORY AUTHORITY*

## *Potassium--30 USC § 281-287*

- “chlorides, sulphates, carbonates, borates, silicates, or nitrates of potassium”
- “royalty of not less than 2 per centum of the quantity or gross value of the output of potassium compounds and other related products, except sodium, at the point of shipment to market”



# *REGULATORY AUTHORITY*

## *30 CFR §206.301*

- **Value basis for royalty computation**
- **Royalty value largely depends on the disposition of lease products:**
  - Royalty on lease products sold under arm's-length conditions will be based on their sales prices.**



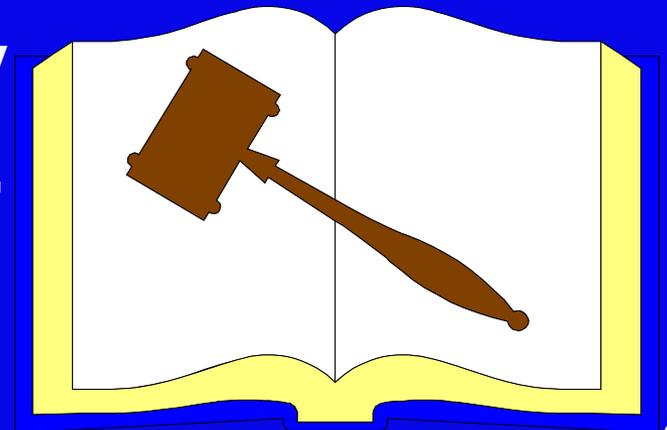
# *REGULATORY AUTHORITY*

## *30 CFR § 206.301 (cont.)*

■ --Royalty value for lease products:

- sold under non-arm's-length conditions, or
- sold for considerations in lieu of or in addition to sales price, or
- consumed by lessee

will be determined by an authorized officer.



# *REGULATORY AUTHORITY*

## *30 CFR §206.301 (cont.)*

- **Authorized officer will generally be:**

**John Hovanec, Program Manager  
Solids Minerals & Geothermal CAM.**



# *REGULATORY AUTHORITY*

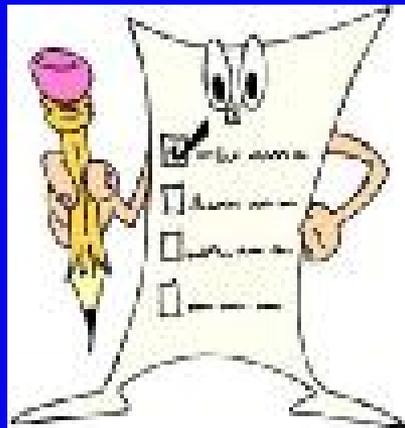
## *30 CFR § 206.301 (cont.)*

- **Authorized officer must take into account:**
  - prices lessee receives for arm's-length sales
  - prices paid for like-quality commodities in area
  - other relevant factors.



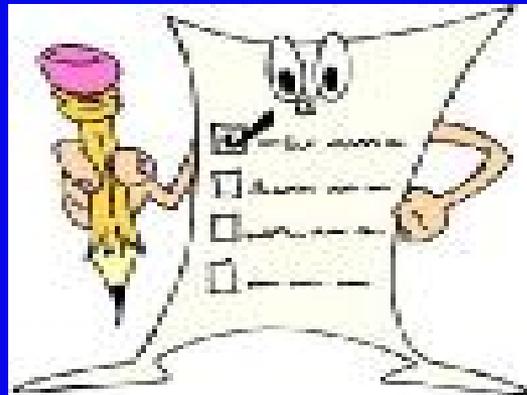
# COMMON LEASE TERMS

- Older leases (before 1980)
- 5% ad valorem royalty
- Gross output of the lease deposits
- At the point of shipment to market



# COMMON LEASE TERMS

- **Newer leases (after 1980)**
- **5% ad valorem royalty**
- **Gross output of the lease deposits**
- **At the point of shipment to market and/or the place of consumption**



# *COMMON LEASE TERMS*

## *Future and renewing leases*

- **In Wyoming only**
- **8% ad valorem royalty for new sodium leases**
- **6% ad valorem royalty for renewing sodium leases**
- **Gross output of the lease deposits**
- **At the point of shipment to market and/or the place of consumption**
- **Diligence clause**

# *GUIDELINES*

- **“Guidelines for Determining the Value to be Used to Compute Royalty on Federal Potassium and Sodium Leases”**
- **Assistant Secretary - Energy and Minerals**
- **1977 Guidelines**



# VALUATION PRINCIPLES

- Interpretation

Valuation  
Principles  
into Practice

5th Edition

Richard Hawwood



FTC Books

# VALUATION PRINCIPLES



## *Primary products*

- **Primary products include those products which are naturally occurring components of the ore or brine.**
- **Primary products are the first marketable products produced from processing the raw ore or brine without adding reagents that end up in marketed product.**
- **Other primary products may be unprocessed or incompletely processed products.**

# *VALUATION PRINCIPLES*

## *Primary products--A-L sales*



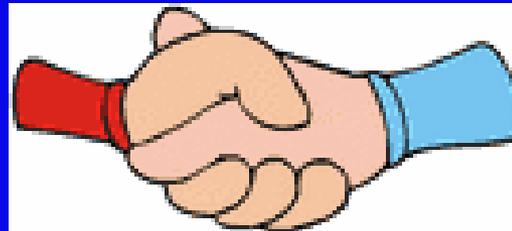
- **Royalty on primary products will be based on gross value of primary product sales.**
- **Gross value of primary products sold by lessees will be contract value of products sold under arm's-length conditions, f.o.b. mine.**

# VALUATION PRINCIPLES

## *Primary products--A-L sales*



- Value for royalty purposes will be sales or contract unit price (f.o.b. mine) times number of units sold.



# *VALUATION PRINCIPLES*

## *Primary products-gross proceeds*

- **Value for royalty purposes may not be based on less than gross proceeds accruing to lessee for primary products sold.**
- **Gross proceeds is defined as total moneys and other consideration accruing to lessee for disposition of primary products.**



# *VALUATION PRINCIPLES*

## *Primary products-gross proceeds*

- **If sales value includes considerations other than sales price, those considerations are part of gross proceeds.**
- **Dollar equivalent value of those considerations must be included in gross value for royalty purposes.**

# *VALUATION PRINCIPLES*

## *Primary products--transportation*

- **Where sales or contract price includes cost of transporting product from mine to distant sales point, lessee will be permitted transportation deduction.**



# VALUATION PRINCIPLES

## *Primary products--example*



- 800 tons bulk ash @ \$80/ton (weighted average), at mine
- 300 tons bulk ash @ \$98/ton, at dest.  
\$16/ton out-of-pocket transportation cost
- Royalty values:
  - 800 tons bulk ash @ \$80/ton, at mine
  - 300 tons bulk ash @ \$82/ton, at mine
- Weighted average sales price:  
 $(800 \times \$80 + 300 \times \$82)/1100 = \$80.54$
- Roy =  $1100 \times 80.54 \times .05 = \$4,429.7$

# *VALUATION PRINCIPLES*

## *Primary products--transportation*

- **No transportation allowance is permitted for cost of transporting ore from mine to processing plant.**
- **Under no circumstances reported sales price less permitted transportation costs be less than average gross value of specific product, f.o.b. mine.**

# VALUATION PRINCIPLES

## *Primary products--example*

- 2500 tons bulk ash @ \$80/ton (w. a.), at mine
- 300 tons bulk ash @\$94/ton, at dest. \$16/ton transportation cost = \$78 f.o.b. < \$80, use \$80/ton
- 200 tons bulk ash @\$98/ton, at dest. \$16/ton transportation cost = \$82/ton, at mine
- Royalty Value:
  - 2500 tons bulk ash @ \$80/ton, at mine
  - 300 tons bulk ash @ \$80/ton, at mine
  - 200 tons bulk ash @ \$82/ton, at mine

# *VALUATION PRINCIPLES*

## *Primary products--transportation*

- On the P&R form, we require reporters to include the allowed transportation cost.
- The system will compute the transportation deduction by lease.

# VALUATION PRINCIPLES

## *Primary products--transportation*

- **Example:**

- 200 tons bulk ash @ \$80/ton (w. a.), at mine

- 200 tons bulk ash @ \$86/ton, at dest.  
\$8/ton transportation cost = \$78 f.o.b. < \$80, use \$80/ton

- 400 tons bulk ash @ \$89.5/ton at dest.  
\$11/ton transportation cost = \$78.5 f.o.b. < \$80, use \$80/ton

# VALUATION PRINCIPLES

## *Primary Products --- example, cont.*

-Gross proceeds (f.o.b. mine) = 200 tons x \$80/ton = \$16,000

-Gross Proceeds (@ dest.)= 200 tons x \$86/ton = \$17,200

-Transportation Cost = 200 tons x \$6/ton trans. cost = \$1,200

-Gross proceeds (@ dest.) = 400 tons x \$89.5/ton = \$35,800

-Transportation cost = 400 tons x \$9.5/ton trans. cost = \$3,800

- Sum on P&R

- Tons sold = 800, Gross proceeds = \$69,000

- Transportation cost = \$5,000

- Royalty = (\$69,000 - \$5,000) x .05 = \$3,200

# Lease-level data input page

## Volume and Value Allocation for Lease 1:

[Log Out of P&R](#)

[Help](#)

<b>Mine Name</b>	<b>Business Unit</b>	<b>Sales Month/Year</b>	<b>Sales Point</b>	<b>Product</b>
Mine No. 1	Federal/State/Fee	November, 2003	Mine	Gilsonite

### P & R Original

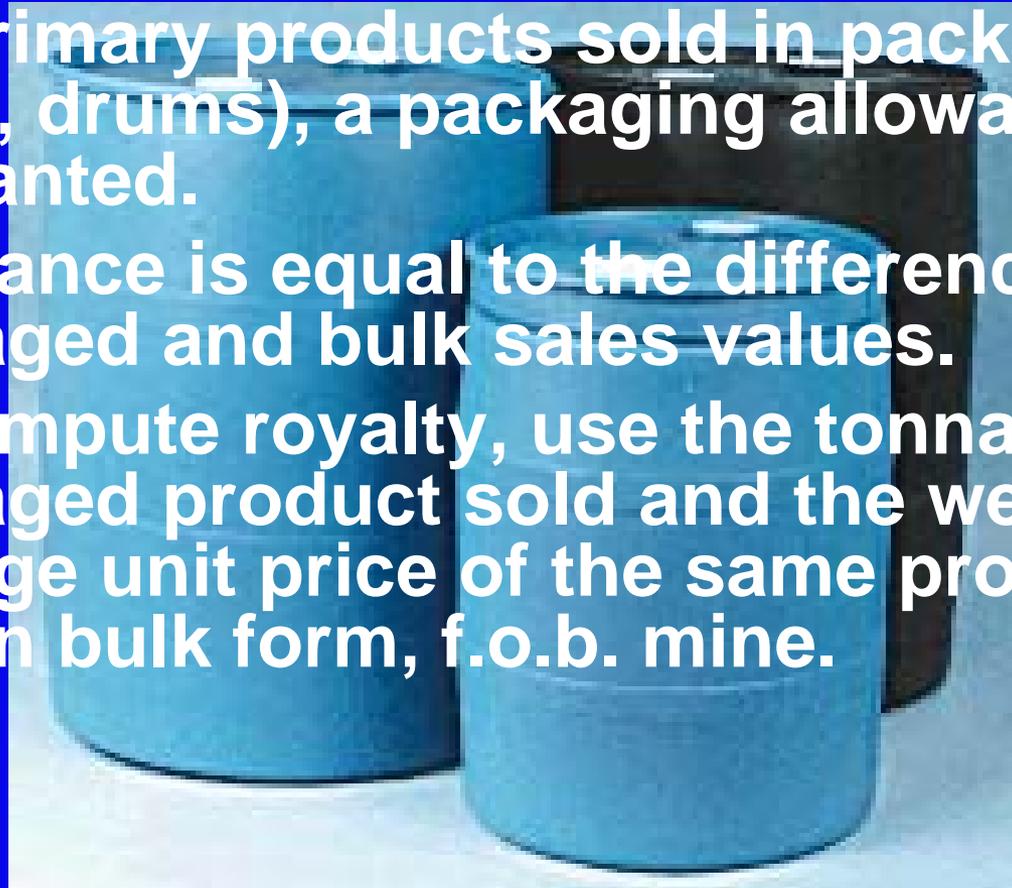
Total Units Sold:	<input type="text" value="800"/>	Total Units Transferred:	<input type="text" value="50"/>	<input type="button" value="Allocate Volume"/>
Total Gross Proceeds:	<input type="text" value="\$ 69000"/>	Total Allowed Processing Cost:	<input type="text" value="\$ 1000"/>	<input type="button" value="Allocate Value"/>
Total Allowed Transportation Cost:	<input type="text" value="\$ 5000"/>			<input type="button" value="Calculate Royalty Due"/>
				<input type="button" value="Save Before Submitting"/>

<b>Lease Number:</b>	<input type="text" value="UTU XXX1"/>	<b>Royalty Rate/Fixed Rate:</b>	<input type="text" value="10%"/>	<b>Land Class:</b>	<input type="text" value="FED"/>
Beginning Inventory:	Inventory/Volume Adjustment:	Units Produced:	Production Available for Sale:	Units Transferred:	Units Sold:
862	<input type="text" value="-10"/>	<input type="text" value="48"/>	<input type="text" value="900"/>	<input type="text" value="30"/>	<input type="text" value="300"/>
Ending Inventory:	Gross Proceeds:	Allowed Transportation Cost:	Allowed Processing Cost:	Royalty Before Allowance:	Royalty Payment:
<input type="text" value="570"/>	<input type="text" value="\$ 25875"/>	<input type="text" value="\$ 1875"/>	<input type="text" value="\$ 375"/>	<input type="text" value="\$ 2588"/>	<input type="text" value="\$ 2362"/>

# VALUATION PRINCIPLES

## *Primary products--allowances*

- **Packaging allowances:**
- For primary products sold in packages (bags, drums), a packaging allowance will be granted.
- Allowance is equal to the difference of packaged and bulk sales values.
- To compute royalty, use the tonnage of packaged product sold and the weighted average unit price of the same product sold in bulk form, f.o.b. mine.





# *VALUATION PRINCIPLES*

## *Primary products--allowances*

- If lessee has no or insignificant A-L bulk sales, royalty value will be based on packaged sales price less packaging costs.
- In the case of insignificant bulk sales, that royalty value can be no less than the calculated value using the unit price received for same product sold in bulk form.



# *VALUATION PRINCIPLES*

## *Primary products--allowances*

- On the P&R form, reporters enter the total actual or computed allowable packaging cost. The entry is made in the Processing Cost box.
- The system will compute the packaging allowance by lease.

# Lease-level data input page

## Volume and Value Allocation for Lease 1:

[Log Out of P&R](#)

[Help](#)

<b>Mine Name</b>	<b>Business Unit</b>	<b>Sales Month/Year</b>	<b>Sales Point</b>	<b>Product</b>
Mine No. 1	Federal/State/Fee	November, 2003	Mine	Gilsonite

### P & R Original

Total Units Sold:	<input type="text" value="800"/>	Total Units Transferred:	<input type="text" value="50"/>	<input type="button" value="Allocate Volume"/>
Total Gross Proceeds:	<input type="text" value="\$ 69000"/>	Total Allowed Processing Cost:	<input type="text" value="\$ 1000"/>	<input type="button" value="Allocate Value"/>
Total Allowed Transportation Cost:	<input type="text" value="\$ 5000"/>			
		<input type="button" value="Calculate Royalty Due"/>		<input type="button" value="Save Before Submitting"/>

<b>Lease Number:</b> <input type="text" value="UTU XXX1"/>		<b>Royalty Rate/Fixed Rate:</b> 10%		<b>Land Class:</b> FED	
Beginning Inventory:	Inventory/Volume Adjustment:	Units Produced:	Production Available for Sale:	Units Transferred:	Units Sold:
862	<input type="text" value="-10"/>	<input type="text" value="48"/>	<input type="text" value="900"/>	<input type="text" value="30"/>	<input type="text" value="300"/>
Ending Inventory:	Gross Proceeds:	Allowed Transportation Cost:	Allowed Processing Cost:	Royalty Before Allowance:	Royalty Payment:
<input type="text" value="570"/>	<input type="text" value="\$ 25875"/>	<input type="text" value="\$ 1875"/>	<input type="text" value="\$ 375"/>	<input type="text" value="\$ 2588"/>	<input type="text" value="\$ 2362"/>



# *VALUATION PRINCIPLES*

## *Primary products--allowances*

- If the lessee tracks actual packaging costs, he can request that MMS approve his claiming packaging allowances based on those actual costs (AL or NAL).
- Royalty will be based on packaged sales price less actual packaging costs.

# *REPORTING ALLOWANCES ON P&R*

- **Packaging: enter cost or difference between sales price and bulk price (in Processing Cost Box)**
- **Packaging and Transport:**
  - Option 1: bulk mine price, enter difference between sales price and bulk price (in Processing Cost Box).
  - Option 2: actual cost for both, enter actual transport cost (in Transport Cost Box) and actual packaging cost (in Processing Cost Box).

# *VALUATION PRINCIPLES*

## *Primary products--NAL sales*

- **Primary products may also be:**
  - sold under NAL conditions
  - consumed internally by lessee.
- **Generally, royalty value will be based on sales price lessee receives in comparable arm's-length sales.**
  - Use the weighted average of all AL sales of the same product.
- **Gross proceeds comparison.**

# *VALUATION PRINCIPLES*

## *Primary products--NAL sales*

- **Application of gross proceeds comparison:**
  - **If the NAL f.o.b. mine price is less than the lowest comparable AL f.o.b. mine price of the same product, use the weighted average of all AL sales for computing royalty.**
  - **If the NAL f.o.b. mine price is equal to or greater than the lowest (within the range or higher) of comparable AL f.o.b. mine prices of the same product, use the NAL f.o.b. mine price for computing royalty.**

# *VALUATION PRINCIPLES*

## *Primary products--NAL sales-example*

- You sold AL f.o.b. mine
- 200 tons @ \$80/ton = \$16,000
- 300 tons @ \$86/ton = \$25,800
- 500 tons @ \$92/ton = \$46,000
- Weighted average \$87.8/ton

# VALUATION PRINCIPLES

## *Primary products--NAL sales-example*

- You sold NAL f.o.b. mine
- 400 tons @ \$75/ton < \$80 use \$87.8
- 200 tons @ \$79/ton < \$80 use \$87.8
- 100 tons @ \$82/ton > \$80 use \$82
- 300 tons @ \$96/ton > \$80 use \$96

# VALUATION PRINCIPLES

## *Primary products—NAL (Inter. Cons.)- example*

- **What is the royalty value of soda ash consumed internally by the lessee?**
- **His arm's-length sales are:**
  - 100 tons bulk ash @ \$80/ton, at mine**
  - 200 tons bulk ash @ \$98/ton, at dest.**
  - \$16/ton out-of-pocket transportation cost =**
  - \$82/ton at mine**

# VALUATION PRINCIPLES

*Primary products—NAL (Inter. Cons.)- example*

- **Answer: based on arm's-length sales royalty value**
- **Royalty values:**
  - 100 tons bulk ash @ \$80/ton, at mine
  - 200 tons bulk ash @ \$82/ton, at mine
- **AL sales weighted average is \$81.33/ton**

# VALUATION PRINCIPLES

## *Primary products—NAL (Inter. Cons.)- example*

- If lessee makes insignificant or no arm's-length sales of a particular product, use the regional weighted average sales value, provided by MMS, to calculate royalties for that product.
- If the NAL sales price is higher, use the NAL sales price.

# *VALUATION PRINCIPLES*

## *Domestic and Foreign Sales*

- **Same valuation rules**
- **Separate and equal:**
  - **Use averages of only domestic sales to value other domestic sales**
  - **Use averages of only foreign sales to value other foreign sales**

# *VALUATION PRINCIPLES*

## *Foreign Sales*

- **ANSAC (American Natural Soda Ash Co. A cartel of producers for foreign sales)**
  - sales are arm's-length**
  - make sure that the price received by ANSAC is that used for royalties**
  - no deductions other than transportation, if applicable**
  - make sure to use actual quarterly/yearly payments.**
  - if necessary, submit revised royalty reports.**



# VALUATION PRINCIPLES

## *First Marketable Secondary Products--Reagents*

- **Products may be produced with or without use of lessee-introduced reagents.**
- **Reagent is defined as a chemical (or a component of a chemical) used in processing ore.**
- **If the reagent becomes part of a marketed product, product is termed secondary.**

# VALUATION PRINCIPLES



*First Marketable Secondary Products--Reagents*

- If the reagent becomes part of a marketed product, we grant lessee royalty deductions (reagent allowances) for value of reagent.
- However for reagent allowance to be permitted, elements of reagent may not occur naturally in ore in same or greater quantity as in product sold.



# VALUATION PRINCIPLES

*First Marketable Secondary products-Reagent allow.*

- **Value and weight:**

- Reagent value is the actual cost of the reagent.

- Weight of reagent used in determining reagent allowance is weight of reagent entering product sold or consumed, not weight of reagent used by lessee.

# VALUATION PRINCIPLES



*First Marketable Secondary products-Reagent allow*

- *Example: sodium bicarbonate*
- *2 trona ---> 3 soda ash + 1 CO<sub>2</sub> + 5 H<sub>2</sub>O*
- *3 soda ash + 3 H<sub>2</sub>O + 3 CO<sub>2</sub> --->6 bcarb*
- $$\frac{\text{Molecular Weight 2 CO}_2}{\text{Molecular Weight 6 bicarb}} = 0.175$$



# VALUATION PRINCIPLES

*First Marketable Secondary products-Reagent allow*

- **Example: sodium bicarbonate (cont.)**

- **If you produced:**

**100 tons Sodium Bicarbonate**

- **You added:**

**17.5 tons of CO<sub>2</sub>**



# VALUATION PRINCIPLES

*First Marketable Secondary products-Reagent allow*

■ **Example: sodium bicarbonate (cont.)**

■ **Product royalty:**

**100 tons of sodium bicarbonate at  
\$140/ton, and 17.5 tons CO<sub>2</sub> at \$40/ton**

**5% royalty rate**

**Roy = [( tons SB x price – tons CO<sub>2</sub> x price)] x  
royalty rate**

**Roy = [(100x140) – (17.5 x 40)] x .05 = \$665**

# VALUATION PRINCIPLES

*First Marketable Secondary products-  
Reagent allow*



- On the P&R form, reporters enter the total reagent value. The entry is made in the Processing Cost box (summed with any packaging cost).
- System will compute the reagent allowance (or combined reagent/packaging allowance) by lease.

# VALUATION PRINCIPLES

*First Marketable Secondary products-Reagent allow*

- **Except for reagent allowances, no other processing deductions may be claimed for the cost of producing first marketable products.**

# *VALUATION PRINCIPLES*

## *Allowances*

- **Sodium/Potassium – lessees only permitted to deduct cost of transporting lease production, not the reagent component of product sold.**
- **Similarly, the rules limit packaging deduction to cost of packaging lease materials, not reagent component of product sold.**

# *VALUATION PRINCIPLES*

## *Processing products to higher grades*

- **When first marketable primary product undergoes supplemental treatment or additional refining to produce higher grades or different particle sizes of same compound, resulting product is also considered primary.**
- **If conditions warrant, and at MMS' discretion, MMS may permit you to value the product at its original (lower grade) price.**
- **First Marketable secondary product further treated as above and sold will be valued at its sales price.**

# VALUATION PRINCIPLES

## *Secondary Products*



- When the first marketable product is produced with the use of a reagent, the product is a secondary product.
- When a primary product undergoes chemical processing and is used to make another saleable compound, the result is a secondary product.



# *VALUATION PRINCIPLES*

## *Secondary prods.--royalty values*

- **Royalty on secondary products, produced from primary products, will be based on:**
  - tonnage of primary product consumed to produce the secondary product sold**
  - sales price of primary product consumed to produce secondary product sold.**



# VALUATION PRINCIPLES

## *Secondary prods.--royalty values*

■ **Royalty value equals:**

$T_s / Ef_s \times Cf \times P_p$  where

$T_s$  = Secondary product tons sold

$Ef_s$  = Secondary product process efficiency factor

$Cf$  = Molecular weight conversion factor between primary and secondary products

$P_p$  = Weighted average price of primary product



# VALUATION PRINCIPLES

## *Secondary prods.--royalty values*

- **Molecular weight conversion factor:**  
$$\frac{\text{MW primary product consumed}}{\text{MW secondary product produced}}$$
- **Expl: Soda ash is used to make TSP**  
$$2 \text{ soda ash} + 2 \text{ phos. acid} \rightarrow \text{TSP} + \text{CO}_2 + \text{H}_2\text{O}$$
- $$2 \text{ MW Soda ash} / \text{MW TSP} = 2 \times 105.989 / 265.904 = 0.797$$



# VALUATION PRINCIPLES

## *Secondary prods.--royalty values*

- **Example: 100 tons of TSP**

- $Ef_s = 98.9\%$   
 $P_p = \$70/\text{ton}$   
 $Cf = 0.797$   
 $RR = 5\%$

- $Roy = (100 / 0.989) \times .797 \times 70 \times .05$   
 $Roy = \$282$

# *VALUATION PRINCIPLES*

## *Court Cases*

Court Decisions



# VALUATION PRINCIPLES

## *Precedent Setting Decisions*



- **U.S. v. Southwest Potash Corp.**
  - sold unprocessed ore to another potash producer who produced finished product
  - Southwest Potash paid royalties on value of unprocessed ore
- **Issue: What is the correct royalty value?**
- **Decision: Royalty value must be the same as if Southwest Potash had produced the finished product**

# VALUATION PRINCIPLES

## *Southwest Potash Decision (cont)*



- **Based on lease and statute provisions:**
  - Secretary of DOI may establish minimum values, taking into consideration like quality products from the same general area.
  - Royalty is due on output of the lease at the point of shipment to market

# VALUATION PRINCIPLES

## *Southwest Potash Decision (cont)*



- **Market provision carries with it the implied requirement that lessee must place leased mineral in marketable condition at no cost to lessor**
- **There is a difference between marketing and merely selling; marketing requires a clearly defined market for the product**

# *VALUATION PRINCIPLES*

## *Precedent Setting Decisions*



- **IBLA decision 79-205, FMC Corp.**
  - consumed soda ash to make a secondary product
  - soda ash was not a finished product when it was consumed; it was in slurry form
- **Issue: What is the correct royalty value?**
- **FMC wanted the royalty value to be based on a price less than soda ash.**

# VALUATION PRINCIPLES

## *FMC Corp-IBLA Decision (cont)*



- Decision: same value as finished soda ash.
- IBLA decided royalty should be based on the customary product sold to the marketplace--soda ash.
- To base royalty on value less than soda ash price would be granting a processing allowance.

# *VALUATION PRINCIPLES*

## *FMC Corp-IBLA Decision*

- **IBLA decision 96-170 FMC**
  - consumed purified sesquicarbonate solution to produce sodium bicarbonate (SB).
- **Issue: what is the correct royalty value for SB.**
- **FMC wanted the royalty value to be based on the price of soda ash.**

# *VALUATION PRINCIPLES*

## *FMC Corp-IBLA Decision, cont.*

- **Decision: Sales value of SB with reagent allowance.**
- **IBLA decided that SB is a secondary first marketable product and its royalty value is equal to the SB price minus the value of the reagent entering the product sold.**

# VALUATION PRINCIPLES

## *Precedent Setting Decisions*



- IBLA decis. 77- 41, Foote Mineral Co.
  - lithium/sodium chloride brine
  - product is lithium carbonate
  - two reagents used to process
- Issue: They paid royalty for  $\text{Li}_2\text{CO}_3$
- Claimed two reagent allowances

# VALUATION PRINCIPLES

## *Footnote--IBLA Decision (cont.)*



### **USGS concluded:**

- Li<sub>2</sub>CO<sub>3</sub> is the first marketable product.**
- Because it is made with a purchased chemical reagent, it is a secondary product.**
- Because lime reagent did not enter marketed product, no reagent allowance for lime.**

# *VALUATION PRINCIPLES*

## *Foote--IBLA Decision (cont.)*



- **Foote appealed to U.S. Court of Claims.**
- **Court decided:**
  - Since sodium does not have a value, the lithium in the deposit is not leasable.**
  - **--The lithium is a locatable mineral, and no royalties are due on lithium production.**

# *VALUATION PRINCIPLES*

- **Things to remember**



# *SUMMATION AND RULES OF THUMB—Things to look for*

- **AL prices are generally**
  - all bulk sales prices, f.o.b. mine
  - all bulk prices at destination (minus allowable transportation deduction)
  - all sales through ANSAC (foreign sales)
- **NAL prices are generally**
  - all sales to affiliates

# *SUMMATION AND RULES OF THUMB--Things to look for*



- Bagged products--royalty price may not be less than bulk price, except when you use actual bagging costs.
- Destination sales price--royalty price may not be less than f.o.b. mine price.
- Make sure royalty is paid on losses of inventory stored at remote sites.

# *SUMMATION AND RULES OF THUMB--Things to look for*



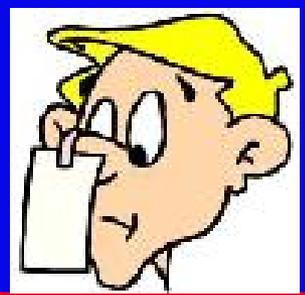
- **Timing of royalty payments**
- **Monthly royalties on primary and secondary products are due no later than month following month primary or secondary product was sold.**

# *SUMMATION AND RULES OF THUMB--Things to look for*



- **Secondary products**
  - make sure conversion efficiencies and molecular weight factors are used.
- **Lessee sales within partnerships and joint ventures:**
  - are generally NAL sales.

# *SUMMATION AND RULES OF THUMB--Things to look for*



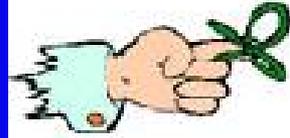
- Under the P&R, AL and NAL sales are not distinguished.
- Sales Summaries should clearly define AL and NAL sales.
- Companies' Royalty Computation Worksheets should also clearly define AL and NAL sales, foreign and domestic.

# *SUMMATION AND RULES OF THUMB--Things to look for*



- **NAL sale royalty values--making the gross proceeds comparison**
  - Compare sales of the same product under comparable contracts.**
  - Compare each NAL sale with the range of AL values for the same product under comparable contracts.**

# *SUMMATION AND RULES OF THUMB--Things to look for*



- **NAL sale royalty values--using an AL value,  
--make sure that foreign and domestic sales are treated separately.**

# *SUMMATION AND RULES OF THUMB--Things to look for*



- **NAL sale royalty values--using an AL value**

**--prices to use to compute weighted average AL price are generally:**

- **all bulk sales, f.o.b. mine**
- **all bulk sales at destination (transportation deduction)**
- **all packaged sales: bulk price**
- **all sales through ANSAC (for foreign sales).**

# *SUMMATION AND RULES OF THUMB--Things to look for*



## **NAL sales:**

**If the lessee has no or insignificant AL sales, MMS will have to develop a valuation method, possibly taking into account:**

- **regional sales values, and**
- **actual packaging costs.**

# *SUMMATION AND RULES OF THUMB--Things to look for*

- **Non deductible expenses:**
- **Items of expense specifically non-deductible for royalty computation are:**
  - **analysis charges**
  - **demurrage within the control of the lessee**
  - **sales commissions, and**
  - **tariffs.**



# THE END

