U.S. Department of the Interior
Report to Congress
The Soda Ash Royalty Reduction Act of 2006

Executive Summary

The Soda Ash Royalty Reduction Act of 2006 provides for a reduction in the soda ash royalty rate to 2 percent for a period of 5 years beginning on the date of enactment of the Act. The royalty rate reduction also applies to the sale of other sodium compounds and related products from Federal leases. The Act requires the Secretary of the Interior to report to Congress by October 11, 2011, on the effects of the rate reduction as to: the amount of sodium compounds and related products shipped to market from Federal lands; the number of jobs that have been created or maintained; and the royalty paid to the U.S. and the portion of such paid to states. Several members of the U.S. Senate also requested that an analysis be included of the effect of the royalty rate reduction on the ability of the domestic soda ash industry to compete in the export market.

Findings

What did happen:

- By Fiscal Year (FY) 2009, the average prices of sodium compounds and related products were 41 percent higher than the FY 2006 pre-royalty rate reduction prices.

- For the 4 years following passage of the Act, total sales revenues from Federal leases were $3.4 billion, more than double the $1.4 billion in total sales revenues from the 4 years before passage of the Act. The increase can be attributed to high sodium prices, increased production, and a shift to Federal lands because the royalty rate has been lower than the rate for state leases and private lands.

- For FY 2007 through FY 2011, royalty revenues will be an estimated $150 million lower than they would have been absent the Act. This amount is five times the loss in royalty revenues that was anticipated by Congress. 50 percent of these revenues go to the states within which the leased lands or deposits are located, 40 percent goes to the Reclamation Fund, and 10 percent goes to miscellaneous receipts in the U.S. Treasury.

- For FY 2007 through FY 2010, the states' portion of the royalty payments from Federal leases would have been $62.1 million higher without the rate reduction.

- Since passage of the Act, a significant amount of production has shifted from state leases and private lands onto Federal leases. Due to the production shift away from state leases, over the 5-year period, the states will experience over $50 million in unrealized royalty payments from state leases.

- Worldwide production of soda ash increased slightly from 41.1 million tons in 2005 to 44.1 million tons in 2009. During this period, China increased production from 14.2 million tons to 19.4 million tons. Most of this production increase is used domestically in China; Chinese exports continue to be well below U.S. exports. U.S. production has been steady at around 11 million tons, until the recent recession; in 2009, U.S. production was 9.3 million tons, and by 2010, it was 10.4 million tons.

- FY 2010 production was about 4 percent lower than production in FY 2006, before the rate reduction. However, by FY 2010, the domestic sales of sodium compounds and related products were approximately 1 percent higher than before the rate reduction in FY 2006.

What did not happen:

- Significant new employment in the soda ash industry did not occur during this period. Domestic employment in the industry has dropped about 10 percent since FY 2006.

- Royalty revenues did not increase during this period. Federal royalty payments peaked in FY 2006 at $29.1 million. Since passage of the Act, Federal royalty payments have not increased but have remained below $20 million per year.

- Capital investment in the soda ash industry did not increase substantially during this period. Since FY 2006, annual capital investments have fallen; however, they have remained above the levels reported for FY 2004 and FY 2005.

- The rate of increase in U.S. exports did not appear to change with the royalty reduction, increasing steadily from FY 2002 through FY 2008, then dropping in FY 2009 with the global economic downturn. U.S. exports recovered in FY 2010, and were 12.0 percent higher than the export totals for FY 2006.

Conclusion

The Act resulted in substantial unrealized royalty revenues to the Federal Government and the states which exceeded Congressional estimates. The royalty rate reduction does not appear to have contributed in a significant way to the creation of new jobs within the industry, to increased exports, or to a notable increase in capital expenditures to enhance production. In addition, the royalty rate reduction appears to have influenced a shift of production away from state leases and private lands and onto Federal leases. With regard to global competitiveness, U.S. production has remained stable at around 11 million tons since 2002, with exports stable at around 5 million tons since 2005. U.S. exports continue to account for over 40 percent of total world exports. In contrast, China's production has doubled since 2002, from approximately 10 million to approximately 20 million tons, while Chinese exports remain far below U.S. exports. Since 2002, world-wide production has risen from 37 million tons to 48 million tons in 2010.

Overall domestic employment has not increased since passage of the Act. However, it is not readily apparent from the available data whether jobs have been maintained due to the royalty

rate reduction in the face of the global economic downturn. Any analysis of the number of jobs maintained during the royalty reduction period is highly uncertain; employment levels in the industry depend on a number of factors, such as soda ash market conditions and employee productivity. Productivity gains tend to put downward pressure on the number of employees in the industry, though output has increased in some years. The royalty reduction may have helped slow the recent job losses, though we do not have data to substantiate that possibility.

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Introduction

Public Law 109-338, the Soda Ash Royalty Reduction Act (the Act) of 2006, enacted on October 12, 2006, reduces the royalty rate for any Federal leases associated with the production and sale of sodium compounds and related products to the statutory minimum rate of 2 percent for the subsequent 5-year period beginning on the date of enactment.[1] The Act mandates the Secretary of the Interior report to Congress on the effects of the royalty reduction before the expiration of the 5-year period.

This report focuses on production of sodium compounds and related products, employment in the soda ash extraction and processing industry, and royalty payments from Federal leases in Wyoming, California, Colorado, and New Mexico. These states account for the vast majority of the production of domestic sodium compounds and related products from Federal lands. This report also discusses other issues including exports of sodium compounds and related products.

This report contains the findings required by the Act, specifically discussing:

- The amount of sodium compounds and related products shipped to market from Federal lands;
- The number of jobs that have been created or maintained; and
- The royalty paid to the U.S. on the sodium compounds and related products and the portion of such paid to states.

Also, at the request of several members of the U. S. Senate, an analysis is included of the effect of the royalty rate reduction on the ability of the domestic soda ash industry to compete in the export market.

[1] Although the title and much of the statements concerning the Act refer to soda ash, the provisions of the Soda Ash Royalty Reduction Act of 2006 actually reduce the royalty rate for all Federal leases that involve sodium minerals. This includes a number of commodities besides soda ash, such as sodium sulfate, borax, boric acid, and sodium bicarbonate. The rate reduction also affects not only Federal sodium leases but also Federal potassium leases that involve the extraction of sodium minerals.

Methodology

The Department's analysis[2] is based on the review of the Act and its legislative history and analysis of data on production, exports, sales values, employment, and royalties. The benchmarks against which the effects of the royalty reduction are evaluated are the conditions that would have been anticipated to prevail absent the royalty reduction.

Legislative Record

This section summarizes the legislative record associated with the Act.

On April 15, 2004, the Subcommittee on International Trade of the Senate Committee on Finance held a hearing in Rock Springs, Wyoming, on International Trade and the Impact on the U.S. Soda Ash Industry. Statements by a number of members of both the House and Senate indicated their concerns that prompted the passage of the Act. One member stated, "The lack of growth in the domestic markets and the ongoing battle to open global markets is hurting the companies, their employees and the communities served by this incredible industry." He went on to state, "The past several years have not been good for the domestic trona producers in terms of growth. It's been relatively flat, prices continue their record slides, profitability has fallen, and most importantly, the number employed in the industry remains in decline."

Another member stated that temporary royalty rate relief is necessary "to allow the industry to begin to see increased export growth and competitiveness in the emerging world market, and above all, to create jobs in Wyoming." The member further stated:

> Now, my proposal will also require follow-up study to revisit the royalty rate reduction to determine if the proposed reduction has had the effect that we want. In other words, we have to answer the question, how are the trona companies going to deal with the money that they save; if it goes to pay the stockholders, is that acceptable, or should the money be reinvested in trying to get more contracts in to gain production so that the Federal and the state treasuries don't lose a lot of money and over time, actually make as much or more. Also, what about the state leases and what about private leases?

In addition, it was expressed that the royalty rate reduction was part of an effort to "allow all Wyoming Soda Ash producers to compete on a level playing field with the likes of China, India and synthetic producers around the world, and in turn create jobs for the people of Wyoming."

During an April 15, 2004, hearing, a member also emphasized the importance of exports and job creation in his prepared statement. Increasing exports, enhancing domestic producers'

[2] The analysis and this report were prepared with input and assistance from the U.S. Department of the Interior's, Bureau of Land Management, Office of Policy Analysis, Office of Natural Resources Revenue, and U.S. Geological Survey. In addition to various government sources, data provided by the Industrial Minerals Association – North America (IMA-NA) was used in preparing this report.

competiveness and creating new jobs were clearly the critical concerns in furthering legislation on the rate reduction.

At the time the bill was being deliberated, the Congressional Budget Office[3] estimated the royalty rate reduction would result in a reduction in Federal royalty payments of about $30 million for the period FY 2007 through FY 2011. As the states where the production occurs receive 50 percent of the Federal royalty, the states' portions would be reduced by an estimated $15 million over the 5-year period.

In Congressional testimony delivered prior to the enactment of P.L. 109-338, the Department testified that it was the agency's view that a 2 percent royalty was well below fair market value for the resource, and as such, could not support the bill.

It should be noted that an administrative process is in place for Federal sodium lessees to apply for a royalty rate reduction. The regulations at 43 CFR 3513 provide the BLM with the authority to provide royalty relief if it is demonstrated that a royalty rate reduction is in the interest of conservation, will encourage the greatest ultimate recovery of the resource, and is necessary either to promote development of the mineral resources or because the operator cannot successfully operate under the existing lease terms.

Background

Soda ash is an alkali chemical refined from the mineral trona or naturally occurring sodium carbonate-bearing brines (natural soda ash) or manufactured from one of several chemical processes (synthetic soda ash). The U.S. has the world's largest natural deposit of trona and is the world's second ranked soda ash-producing nation. Of the various sodium compounds and related products affected by the provisions of the Act, soda ash represents at least 80 percent of the total production, sales, and sales revenues. Much of the background information in this report focuses on the soda ash segment of the industry.

The U.S. Geological Survey (USGS) 2008 Minerals Yearbook, Soda Ash [Advance Release], January 2010, describes soda ash as an important industrial compound used to manufacture chemicals, glass, pulp and paper, soaps and detergents, and many other familiar consumer products. In 2010, the U.S. soda ash industry consisted of five companies. Four of these companies operate five plants in Wyoming that produced soda ash from underground trona ore. One company in California produces soda ash from sodium-carbonate rich brines. Plants in Wyoming and Colorado produce sodium bicarbonate using feedstock from Wyoming.

By 2008, each of the U.S. companies was either wholly owned or partially owned by foreign soda ash-producing companies or foreign soda ash consumers. As a result of a 2008 acquisition, the U.S. soda ash industry for the first time was no longer a primarily U.S.-owned industry; 62 percent was foreign, and 38 percent was domestic.

[3] From the Senate Committee on Energy and Natural Resources report on the Soda Ash Royalty Reduction Act of 2006.

Federal Leases

On October 1, 2010, there were 86 sodium leases covering 113,886 acres in Wyoming, California, Colorado, Arizona, and New Mexico. In October 2006, when the Act was passed, there were 87 leases covering 115,825 acres. Therefore, during the royalty rate reduction period, a few leases were relinquished and a few new leases were issued, but overall there was little change in the number of sodium leases or the acreage leased.

On October 1, 2010, 61 Federal sodium leases were located in Wyoming. Four of these leases had a 5 percent royalty rate, 49 leases had a 6 percent royalty rate, and 8 leases had an 8 percent royalty rate. Most production during the royalty rate reduction period was from the leases with a 6 percent rate; although, two of the leases have a 5 percent rate and two leases with an 8 percent rate were also in production. For FY 2006, the weighted average royalty rate for those leases was 5.6 percent.

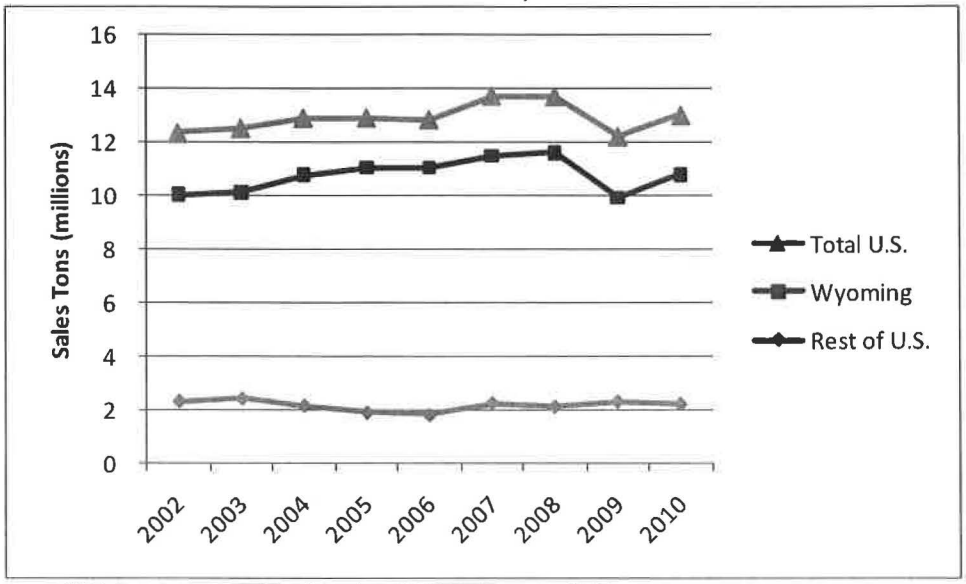
In addition, during the royalty rate reduction period, there were six potassium leases in California and two in New Mexico that produced sodium compounds affected by the Act. These potassium leases have a 5 percent royalty rate.

Domestic Production and Sales

After more than a century of the U.S. leading the world in the production of soda ash, China overtook the U.S. in 2003, and if current trends continue, China will continue to be the world's leader for the foreseeable future. Despite being overtaken by China as the world production leader, the domestic industry has maintained a significant production and export position within the world market. In congressional testimony, the USGS described the domestic soda ash industry as having "the world's largest deposits, the lowest production costs, and the most efficient infrastructure to transport the product to ports."

The analysis of the data suggests that the overall production and sales of sodium compounds and related products did not significantly change due to the rate reduction. Figure 1 – *Domestic Sodium Sales,* shows domestic sales of sodium compounds. From FY 2002 to FY 2010, Wyoming output represented about 80 to 85 percent of total domestic sodium sales.

Figure 1
Domestic Sodium Sales, FY 2002 - 2010



Source: U.S. Department of the Interior, ONRR, January 2011

Total domestic sodium minerals sales from FY 2002 through FY 2010 ranged from 12.2 million tons to 13.8 million tons (Table 1 – *Domestic Sodium Production and Sales*). In FY 2006, the year before the royalty reduction took effect, total domestic sales of sodium compounds and related products were approximately 12.9 million tons. The following year, domestic sodium sales increased 7 percent, reaching 13.8 million tons. By FY 2010, domestic sales were approximately 13.0 million tons, or about 1 percent higher than the total in FY 2006. According to the USGS Mineral Commodity Summary, the global economic problems over the past few years were a significant factor in the reduction in domestic production and sales.

The largest percentage of domestic sodium mineral production and sales comes from soda ash; however, that position has been reduced over the past few years, specifically since passage of the Act. (Table 2 – *Domestic Soda Ash Statistics,* presents production, sales, price, and sales revenues figures for the domestic soda ash industry.) Prior to passage of the Act, soda ash sales and sales revenues represented no less than 90 percent of the domestic sodium minerals market. In FY 2007, soda ash's position had dropped to 85 percent of the total, and by FY 2010 it represented 84 percent of domestic sodium compounds and related products sales and sales revenues.

Although domestic sodium sales figures have been relatively stable for the past decade, there has been a dramatic shift in where the production has occurred. As shown by the data presented in Table 1 and Figure 2 – *Domestic Sodium Sales by Land/Ownership Type*, from FY 2002 through FY 2006, sales from Federal leases accounted for less than 50 percent of the domestic sodium compounds and related products sold each year. Following passage of the Act, there was a clear shift of production off state leases and private lands, and onto Federal leases.

Table 1
Domestic Sodium Production and Sales – FY 2002 to FY 2010[4]
(short tons)

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Production									
Land Ownership									
Fee	5,946,895	5,752,945	8,356,857	6,203,622	6,061,701	6,065,290	4,940,396	4,917,267	5,067,291
Federal	5,411,626	5,252,637	3,294,740	4,955,953	5,911,903	7,174,348	8,643,493	7,440,453	8,052,889
State	971,179	1,603,361	1,290,776	1,802,350	781,897	524,995	174,600	166,316	125,090
Total	12,329,700	12,608,943	12,942,373	12,961,925	12,755,501	13,764,633	13,758,489	12,524,036	13,245,270
State									
Wyoming	10,032,155	10,160,028	10,751,302	11,121,999	10,955,149	11,546,439	11,641,026	10,205,115	11,063,739
Rest of U.S.	2,297,545	2,448,915	2,191,071	1,839,926	1,800,352	2,218,194	2,117,463	2,318,921	2,181,531
Total	12,329,700	12,608,943	12,942,373	12,961,925	12,755,501	13,764,633	13,758,489	12,524,036	13,245,270
Sales									
Land Ownership									
Fee	5,974,148	5,766,230	8,316,558	6,183,758	6,086,131	6,111,805	4,830,435	4,561,269	4,835,557
Federal	5,421,421	5,179,756	3,311,747	5,010,200	5,946,371	7,106,633	8,736,189	7,523,497	8,074,294
State	957,176	1,597,814	1,301,395	1,745,747	833,540	536,206	166,718	152,808	120,849
Total	12,352,745	12,543,800	12,929,700	12,939,705	12,866,042	13,754,644	13,733,342	12,237,574	13,030,700
State									
Wyoming	10,029,074	10,131,173	10,776,815	11,038,258	11,049,731	11,504,038	11,616,944	9,931,456	10,797,710
Rest of U.S.	2,323,671	2,412,627	2,152,885	1,901,447	1,816,311	2,250,606	2,116,398	2,306,118	2,232,990
Total	12,352,745	12,543,800	12,929,700	12,939,705	12,866,042	13,754,644	13,733,342	12,237,574	13,030,700

Source: U.S. Department of the Interior, ONRR, January 2011

[4] The Act reporting requirement is to address the production effects for all sodium compounds and related products. Unless otherwise noted, all tables and figures in this report are for all sodium compounds and related products including soda ash, anhydrous sodium sulfite, deca borax, penta borax, boric acid, sodium bicarbonate, sodium bisulfite, sodium sesquicarbonate, sulfide, and trona ore.

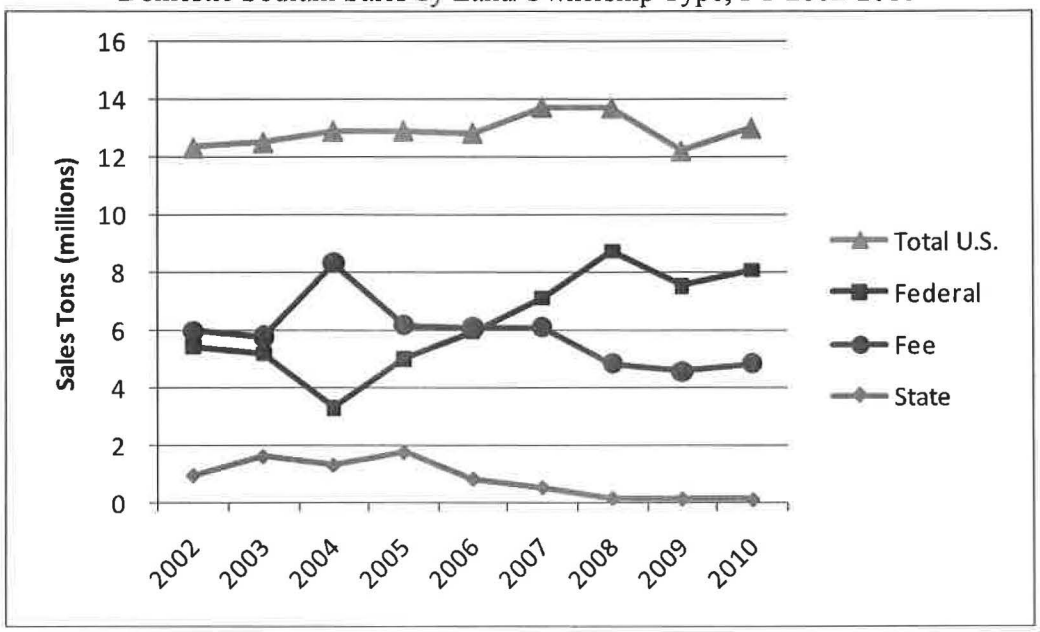
Table 2
Domestic Soda Ash Statistics – FY 2002 to FY 2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Production (short tons)	11,294,533	11,518,692	11,812,775	11,883,036	11,667,879	11,993,957	11,914,121	10,373,605	11,155,048
Sales (short tons)	11,324,467	11,459,966	11,806,406	11,849,730	11,785,362	11,985,653	11,874,433	10,122,563	10,918,396
Price ($/short ton)[5]	65.07	64.43	61.95	74.88	91.52	99.71	113.81	128.67	116.84
Sales Revenues ($)	736,910,311	738,989,432	731,419,805	887,366,336	1,078,565,629	1,195,034,663	1,351,371,800	1,302,480,730	1,275,743,263

Source: U.S. Department of the Interior, ONRR, January 2011

[5] Weighted average annual soda ash price, reported in dollars per short ton by fiscal year.

Figure 2
Domestic Sodium Sales by Land/Ownership Type, FY 2002-2010



Source: U.S. Department of the Interior, ONRR, January 2011

In FY 2005, state leases accounted for 14 percent of domestic production and sales. By FY 2010, state leases accounted for less than 1 percent of domestic sodium production and sales. Sales from private lands peaked in FY 2004 at 8.4 million tons, 65 percent of the total. By FY 2006, sales from private lands were 48 percent of the total. By FY 2010, sodium sales from private lands had dropped to 5.1 million tons or 38 percent of total domestic sales. That same year, sodium sales from Federal leases accounted for over 60 percent of domestic sales.

An explanation for the production shift is that passage of the Act created an incentive to shift production onto Federal lands where the royalty rate is lower. This is especially possible in Wyoming, where the trona mining district's "checkerboard" land ownership pattern allows operators who have the flexibility, mainly those not using long wall mining equipment, to easily shift production to nearby lower-cost areas, in this case to Federal land where the royalty rate is lowest.

Domestic Price and Sales Value

The domestic weighted average annual sodium price, as reported by Office of Natural Resources Revenue (ONRR) has seen a significant increase over the FY 2002 through FY 2010 period. (Table 3 – *Domestic Sodium Price and Sales Revenue,* presents information on domestically produced sodium prices and sales revenues.) The low price for the period ($61.26 per ton) occurred in FY 2004. In FY 2006, the weighted average price had risen to $88.99 per ton ($96.30 per ton in 2010 dollars). By FY 2009, the weighted average price had peaked at $126.18 per ton ($128.30 per ton in 2010 dollars), a 41 percent increase over the FY 2006 pre-royalty rate reduction price. The FY 2010 price declined slightly to $116.61 per ton.

Table 3
Domestic Sodium Price and Sales Revenue – FY 2002 to 2010

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Price ($/short ton)[6]	64.16	63.26	61.28	72.94	88.99	98.33	112.29	126.18	116.61
Inflation-Adjusted Price ($2010)[7]	77.77	74.97	70.74	81.44	96.25	103.41	113.73	128.25	116.61
Sales Revenues[8] ($)									
Land Ownership									
Fee	388,057,337	369,722,872	516,536,875	454,784,828	551,590,979	632,460,344	568,994,656	614,940,006	591,742,347
Federal	345,964,617	327,857,607	200,924,058	355,979,060	522,892,015	673,785,611	960,233,367	916,996,141	920,540,143
State	58,586,745	95,912,505	74,839,179	133,070,948	70,498,490	46,231,233	12,947,797	12,162,617	7,173,753
Total	792,608,699	793,492,984	792,300,112	943,834,836	1,144,981,484	1,352,477,188	1,542,175,820	1,544,098,764	1,519,556,243
State									
Wyoming	653,940,985	647,962,007	665,912,499	828,567,517	1,003,129,987	1,134,374,732	1,306,279,968	1,251,634,805	1,248,203,717
Rest of U.S.	138,667,714	145,530,977	126,387,613	115,267,319	141,851,497	218,102,456	235,895,852	292,463,959	271,352,525
Total	792,608,699	793,492,984	792,300,112	943,834,836	1,144,981,484	1,352,477,188	1,542,175,820	1,544,098,764	1,519,556,243

Source: U.S. Department of the Interior, ONRR, January 2011.

[6] Weighted average annual sodium price, reported in dollars per short ton by fiscal year.
[7] Prices adjusted using the BLS Consumer Price Index – All Urban Consumers (Series Id: CUUR0000SA0).
[8] Sales revenues are reported gross proceeds minus transportation allowances.

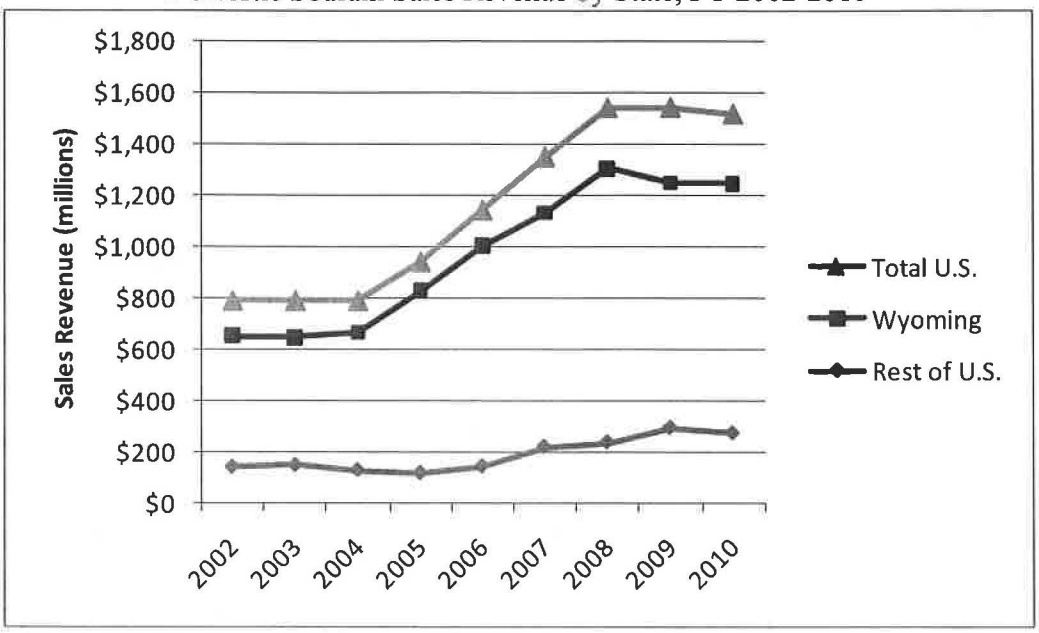
As a result of these price increases, the value of domestic sodium sales (sales revenues) has seen an equally dramatic increase despite relatively little increase in the quantity produced and sold (Table 1). In FY 2006, sales revenues from domestic sodium products sold from Federal leases were reported at $522.9 million; all domestic sources were $1.145 billion. By FY 2008, sodium sales revenues from Federal leases were $960.2 million, or an 84 percent increase in 2 years. The total domestic sales revenues were $1.542 billion in FY 2008. For FY 2009 and 2010, sales revenues from Federal leases remained above $900 million, with total sales revenues of $1.5 billion for sales from all lands, despite the slight decline in domestic sales volumes. For the 4 years preceding the royalty rate reduction, sales revenues from Federal leases were about $1.4 billion. For the 4 years following passage of the Act, sales revenues from products produced from Federal leases totaled approximately $3.5 billion, approximately 150 percent higher than the previous 4 years.

Figure 3 – *Domestic Sodium Sales Revenue by State,* presents the significant growth in sales revenue, especially FY 2005 through FY 2008. This growth in sales revenue is directly tied to the increase in the commodity price and is not as a result of production or sales increases.

While soda ash per-unit revenue is an estimated 44 percent higher in 2010 than it was prior to passage of the Act, major production costs do not appear to have kept pace. The major production costs in soda ash mining are labor and electricity (coal- or natural gas-fired). Based on available data, we estimate labor costs for mining in Wyoming to be about 20 percent higher in 2010 than they were in 2005. Meanwhile, natural gas costs for industrial customers were about 30 percent lower in 2010 than they were when the Act was passed. This suggests that soda ash profits have increased since the passage of the Act. Additionally, some producers offset increases in energy costs by passing them on to buyers, providing further insulation from cost increases.[9]

[9] Surcharges vary across producers in terms of the amount of charges and the threshold at which they are applied. As an example, one producer assesses a charge based on the three-month forward average NYMEX Henry Hub gas price (http://www.ocichemical.com/soda_ash/sa_pricing.asp?SubnavID=15)

Figure 3
Domestic Sodium Sales Revenue by State, FY 2002-2010



Source: U.S. Department of the Interior, ONRR, January 2011

Domestic Employment

The Department identified several sources of data on employment associated with the extraction and processing of sodium compounds and related products. Sources include the USGS Mineral Commodity Summaries, Industrial Minerals Association – North America (IMA-NA) data, and Wyoming State Inspector of Mines Annual Reports. Although the sources are not all consistent in what is being reported, there is a general trend reflected in the data.

Table 4 – *Domestic Soda Ash Mine and Plant Employment,* presents information from 3 sources on domestic soda ash mine and plant employment. IMA-NA provided employment information[10] to Congress along with other salient information concerning extension of the royalty rate reduction. While the IMA-NA employment data does not match the USGS employment data, the information from these two data sources is consistent in that they both indicate that employment remained relatively flat throughout the period of the royalty rate reduction, with a slight decline in 2009. The USGS figures indicate domestic employment at mines and plants involved in the extraction and processing of soda ash has been relatively flat for the past 9 years, from a high of 2,700 in FY 2001 to a low of 2,400 in FY 2009. The recent drop in employment within the industry appears to correspond with the global economic slowdown, and a slight drop in domestic production and sales.

[10] The IMA-NA numbers are WY and CA soda ash mine and plant workers.

Table 4
Domestic Soda Ash Mine and Plant Employment

Employees	2002[11]	2003	2004	2005	2006	2007	2008	2009	2010[12]
USGS	2,600	2,600	2,600	2,600	2,600	2,600	2,500	2,400	2,400
IMA-NA			2,776	2,848	2,915	2,938	2,964	2,859	n/a
Wyoming[13]	2,281	2,185	2,115	2,118	2,259	2,225	2,178	2,141	2,151

Sources: USGS Mineral Commodity Summaries, Soda Ash, January 2001 through 2011, and Industrial Minerals Association – North America (IMA-NA), July 8, 2010, Wyoming State Inspector of Mines Annual Reports for 2002 to 2010

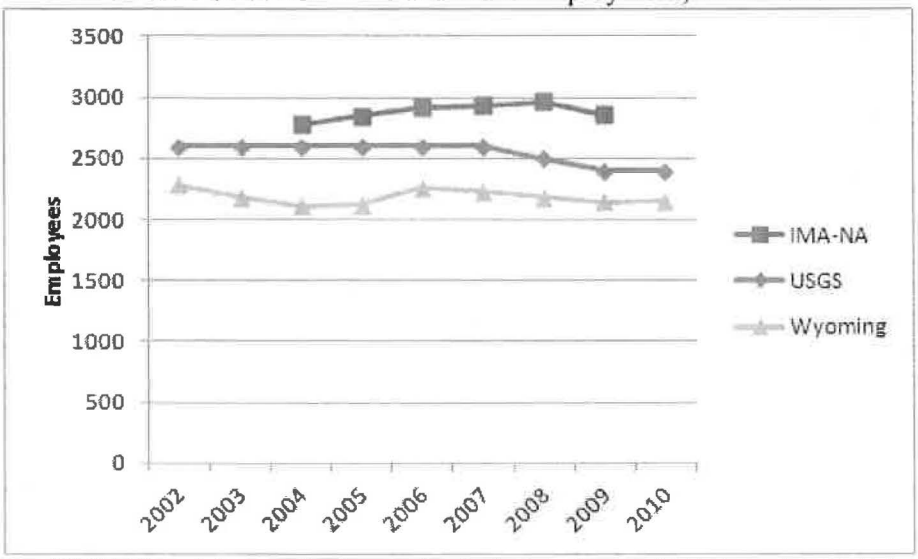
The Wyoming State Inspector's data is limited to surface and underground employees at Wyoming trona mines and mills. This data indicates that the Wyoming trona industry was reducing employment levels from 2002 through 2004, followed by a slight increase in 2005 and 2006, and then a gradual drop in industry employment since 2006. These findings are consistent with the results reported by the USGS.

The Act specifically directs the Secretary to identify the number of jobs "created or maintained during the royalty reduction period." Figure 4 – *Domestic Soda Ash Mine and Plant Employment* shows the employment trends from the USGS, IMA-NA, and the Wyoming State Inspector.

Overall domestic employment has not increased since passage of the Act. However, it is not readily apparent from the available data whether jobs have been maintained due to the royalty rate reduction in the face of the global economic downturn. Any analysis of the number of jobs maintained during the royalty reduction period is highly uncertain; employment levels in the industry depend on a number of factors, such as the overall soda ash market conditions and employee productivity. Productivity gains tend to put downward pressure on the number of employees in the industry, though output has increased in some years. The royalty reduction may have helped slow the recent job losses; though we do not have data to substantiate that possibility.

[11] USGS, IMA-NA and Wyoming State Inspector data are reported on a calendar year basis.
[12] Estimate.
[13] Data from Wyoming State Inspector of Mines Annual Reports - includes surface and underground employees at Wyoming trona mines and mills.

Figure 4
Domestic Soda Ash Mine and Plant Employment, 2002-2010



Sources: USGS Mineral Commodity Summaries, Soda Ash, January 2001 through 2011, Industrial Minerals Association – North America, July 8, 2010, and Wyoming State Inspector of Mines Annual Reports for 2002 to 2010

Federal Royalty Payments

Royalty payments on sales of sodium from Federal leases ranged from a low of $10.3 million in FY 2004 and peaked in FY 2006 at $29.1 million. Table 5 – *Federal Royalty Payments,* and Figure 5 – *Federal Royalty Payments,* present the actual royalty payments for FY 2002 through FY 2010. The steep drop in royalty payments from FY 2006 to FY 2007 is a result of the royalty rate reduction authorized under the Act. Since passage of the Act, Federal royalty payments have remained below $20 million per year.

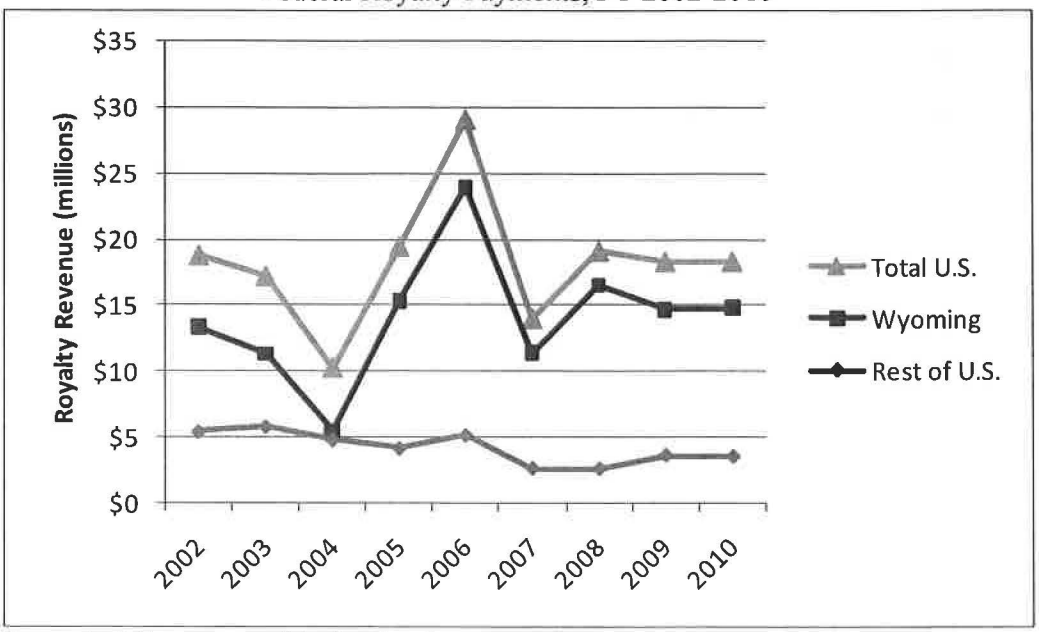
Table 5
Federal Royalty Payments – FY 2002 to FY 2010
($)

	2002	2003	2004	2005	2006	2007	2008	2009	2010
Actual Royalty Payments[14]									
Wyoming	13,354,358	11,340,814	5,502,780	15,320,976	23,939,638	11,405,973	16,544,692	14,683,992	14,820,498
State's Share[15]	6,677,179	5,670,407	2,751,390	7,660,488	11,969,819	5,702,986	8,272,346	7,341,996	7,410,249
Rest of U.S.	5,418,931	5,839,378	4,770,711	4,122,659	5,152,426	2,568,955	2,559,348	3,613,121	3,499,559
States' Share	2,709,465	2,919,689	2,385,355	2,061,329	2,576,213	1,284,477	1,279,674	1,806,560	1,749,779
Total	18,773,289	17,180,192	10,273,491	19,443,635	29,092,064	13,974,928	19,104,040	18,297,113	18,320,057
State's Share	9,386,644	8,590,096	5,136,745	9,721,817	14,546,032	6,987,464	9,552,020	9,148,556	9,160,028
Unrealized Royalty Payments									
Wyoming						20,025,704	30,991,354	27,437,039	27,692,100
State's Share						10,012,852	15,495,677	13,718,519	13,846,050
Rest of U.S.						3,596,251	3,838,998	5,401,517	5,249,338
States' Share						1,798,125	1,919,499	2,700,758	2,624,669
Total						23,621,955	34,830,352	32,838,556	32,941,438
State's Share						11,810,977	17,415,176	16,419,278	16,470,719

Source: U.S. Department of the Interior, ONRR, January 2011

[14] Royalty payments are based on net proceeds from sales and the applicable royalty rate. Net proceeds are derived from gross proceeds less transportation and processing allowances.
[15] Fifty percent of Federal royalty payments are distributed to the state in which the production occurred.

Figure 5
Federal Royalty Payments, FY 2002-2010



Source: U.S. Department of the Interior, ONRR, January 2011

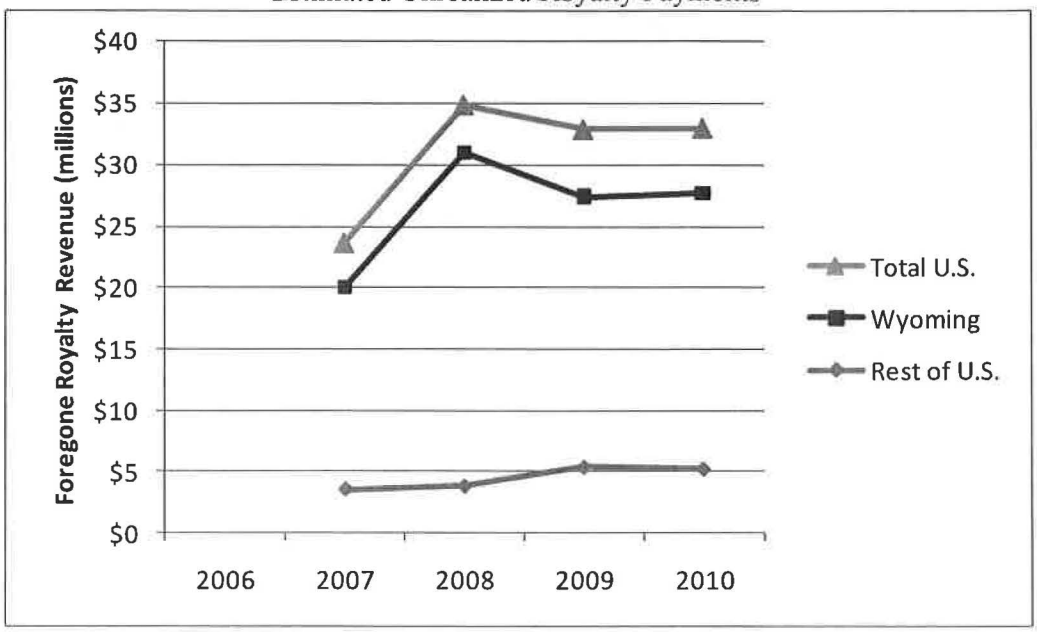
Unrealized Royalty Payments

The reported royalty figures do not fully explain the effect of the royalty rate reduction on the royalty payments. Figure 6 – *Estimated Unrealized Royalty Payments,* and Table 5 – *Federal Royalty Payments*, show estimated unrealized royalty payments. For the period of the reduction (FY 2007 through FY 2010), royalty payments were estimated to be $124.2 million[16] less than they would have been without the rate reduction. To help put this figure in perspective, for the 4-year period since passage of the Act, total Federal royalty payments were actually $69.7 million. Without the royalty rate reduction and no change in where the production occurred, total royalty payments would have been almost three times higher, or $193.9 million for that 4-year period.

The Act also reduces the royalty rate for FY 2011. Given sodium prices and domestic production and sales figures for the past 3 years, the Department's estimated unrealized royalty payments for FY 2011 are in the range of $30 to $35 million. Estimated unrealized Federal royalties for the 5-year period are more than $150 million.

[16] This calculation of the unrealized royalties assumes sodium production and sales from Federal leases that mirror the actual production and sales figures that were reported for FY 2007 to 2010. Estimates of the unrealized royalty payments are the difference in the actual payments with a 2 percent royalty rate and the weighted average rate for FY 2006 (5.6 percent).

Figure 6
Estimated Unrealized Royalty Payments



Source: U.S. Department of the Interior, ONRR, January 2011

The calculations of the unrealized royalties assume that production and sales in FY 2007 through FY 2010 without the provisions of the Act would have been the same as the production and sales that were reported with the royalty reduction. The unrealized royalty payment estimates are based on the difference between a 2 percent royalty rate mandated by the Act and the weighted average royalty rate[17] in FY 2006.

There are some limitations to the conclusions that can be drawn from this assumption. However, this assumption also highlights one of the unintended consequences of the royalty rate reduction—the very dramatic production shift away from state leases and private lands and onto Federal leases following the passage of the Act.

For an alternative estimate of unrealized royalty payments from Federal leases, we attempted to account for the effects of the production shift off state leases and private lands. In FY 2006, sales of sodium compounds from Federal leases accounted for 46 percent of total domestic sales. Assuming the percentage of U.S. production from Federal lands remained constant at the pre-Act level for FY 2007 to 2010, we obtained an alternative estimate of $83 million in unrealized royalty payments. Table 6 – *Alternative Sodium Sales Scenario* presents the sales, net proceeds and unrealized royalties under such a scenario.

[17] As all Federal leases in FY 2006 did not have the same royalty rate, a weighted average rate (5.6 percent) was calculated by summing total Federal royalties paid in FY 2006 and dividing that total by the total of Federal net proceeds reported.

Table 6
Alternative Sodium Sales Scenario[18]

	2006	2007	2008	2009	2010
Total Sales	12,866,042	13,754,644	13,733,342	12,237,574	13,030,700
Federal Sales	5,946,371	7,106,633	8,736,189	7,523,497	8,074,294
Federal Sales Calculated		6,327,136	6,317,337	5,629,284	5,994,122
Federal Net Proceeds ($)	520,308,028	671,180,691	955,201,199	914,250,164	916,002,831
Net Proceeds Calculated ($)		619,353,982	704,771,146	706,619,966	694,914,335
Federal Royalty Payments ($)	29,092,064	13,974,928	19,104,040	18,297,113	18,320,057
Royalty Payments Calculated ($)		34,683,823	39,467,184	39,570,718	38,915,203
Unrealized Royalty Payments ($)[19]		20,708,895	20,363,144	21,273,605	20,595,146

Source: U.S. Department of the Interior, Bureau of Land Management and Office of Policy Analysis

Given sodium prices and domestic production and sales figures for the past 3 years, the Department's estimated unrealized royalty payments using this alternative assumption for FY 2011 are approximately $20 million. Estimated unrealized royalties for the 5-year period from Federal leases are more than $100 million.

In assuming that absent the royalty rate reduction, no production would have shifted to Federal leases, we must also account for the scenario's higher royalty revenues that would have occurred from state leases. Unrealized revenues from state leases are estimated to be about $40 million for FY 2007 to 2010; over $50 million when FY 2011 estimates are included (discussed below). The cumulative impact of Federal and state royalty revenues from both Federal and state leases would be approximately $150 million for the 5-year period of the royalty rate reduction. Not surprisingly, this estimate for unrealized royalties from both Federal and state leases mirrors the estimate for only Federal leases when we assume no correction for production shifting off state leases.

State Royalty Payments

The Act requires that the Secretary evaluate how the royalty reduction affected royalty payments to the states. Fifty percent of royalty payments from Federal sodium leases are distributed to the state in which the production occurred. For the 4-year period ending in FY 2010, the states' portion of the royalties from Federal sodium leases was $34.8 million. The states' portion of the unrealized Federal royalty for FY 2007 through FY 2010 is estimated to be $62.1 million. Including FY 2011, we estimate the states' portion of the royalties is at least $75 million less than what would have been distributed without the royalty rate reduction.

As shown in Table 1, the royalty rate reduction did create production shifts. Sodium production from state leases dropped from 1.8 million tons in FY 2005 to 125,090 tons in FY 2010 as production shifted away from state leases and onto Federal leases. Assuming those production

[18] This alternative scenario assumes the Federal percentage of total sale remains unchanged for FY 2006 through 2010.
[19] The unrealized Federal royalty payments are the difference between actual royalties and the calculated royalty payments.

shifts were a direct result of the royalty rate reduction, we estimate sodium sales from state leases would have been approximately 1.7 million tons higher in FY 2010 without the reduction in the Federal royalty rate. Using the weighted average price for FY 2010 of $116.61 per ton and a royalty rate of 6 percent, royalty revenues from state leases would have been approximately $12 million higher in FY 2010. For FY 2007 to FY 2011, the Department estimates the impact of the production shift due to the royalty rate reduction was over $50 million in unrealized royalty revenue from state leases.

The reduction in the Federal royalty rate appears to have increased production on Federal lands at the expense of production on state and private lands. In the absence of the Act, this production would have instead occurred on the state and private lands. The rate reduction may have also caused an increase in total production, as there was a slight increase in total production in FY 2007 and FY 2008 that otherwise might not have occurred.

As a consequence of the Act, States saw offsetting effects to their revenues: lower royalty revenues from state-land production, and higher revenues from their share of Federal-land production. As a result of this shift, certain state resources were not produced. These resources remain available for future development and will provide future revenue to the States.

Under our alternative scenario, we must consider a baseline in which no production shift occurred. This requires us to allocate some production back to state and private lands, and away from Federal lands. This unambiguously lowers Federal royalties, and results in offsetting effects to state royalty revenues. Federal royalty payments to the States fall with every ton of production reallocated away from Federal lands. Meanwhile state royalty revenues increase, but only based on the portion of production reallocated towards state lands. The States receive no revenue increase from production reallocated to private lands.

Industry Capital Investment

One of the rationales for the royalty rate reduction was to provide an opportunity for the industry to undertake new capital investments.

Material prepared by IMA-NA provides some information on the domestic industry capital expenses for 2004 through 2009, as summarized in Table 7 – *U.S. Industry Capital Expenditures*. The IMA-NA material indicates that from 2004 to 2006 there was a significant increase in capital investment, increasing from approximately $66.7 million in 2004 to $159.5 million in 2006. The almost $160 million invested in 2006 represents the high for the 6 years of data provided. Since 2006, annual capital investments have fallen; however, they have remained above the levels reported for 2004 and 2005.

Table 7
U.S. Industry Capital Expenditures
($1,000)

Year	2004	2005	2006	2007	2008	2009
Capital Expenditures	66,715	87,490	159,526	118,936	148,581	109,831
Inflation-Adjusted Capital Expenditures ($2009)[20]	76,041	95,340	164,754	117,326	146,694	109,831

Source: Industrial Minerals Association – North America, July 8, 2010

As capital expenses can cover a wide range of undertakings, including routine replacement of equipment, the BLM requested clarification from IMA-NA as to what capital improvements were associated with the cost figures supplied for 2004 – 2009. In response, IMA-NA[21] provided a list of example capital investments. The examples cover $116 million in capital expenditures, including replacement, upgrade, and expansion efforts. The largest share of the presented examples, $70 million to replace a longwall miner, would generally be considered expenditures to maintain or replace existing capacity. At most, $46 million of the example expenditures (40 percent) might be characterized as enhancing or expanding production. In addition, the capital investments included in the totals shown in Table 7 may or may not have been made absent the royalty rate reduction.

[20] Prices adjusted using the BLS Producer Price Index for "Other heavy machinery rental and leasing" (Series Id: PCU532412532412).
[21] Email from Jay Sullivan, Jamison and Sullivan, Inc. to Vincent Vogt, BLM, 11/18/2010.

World View and U.S. Exports

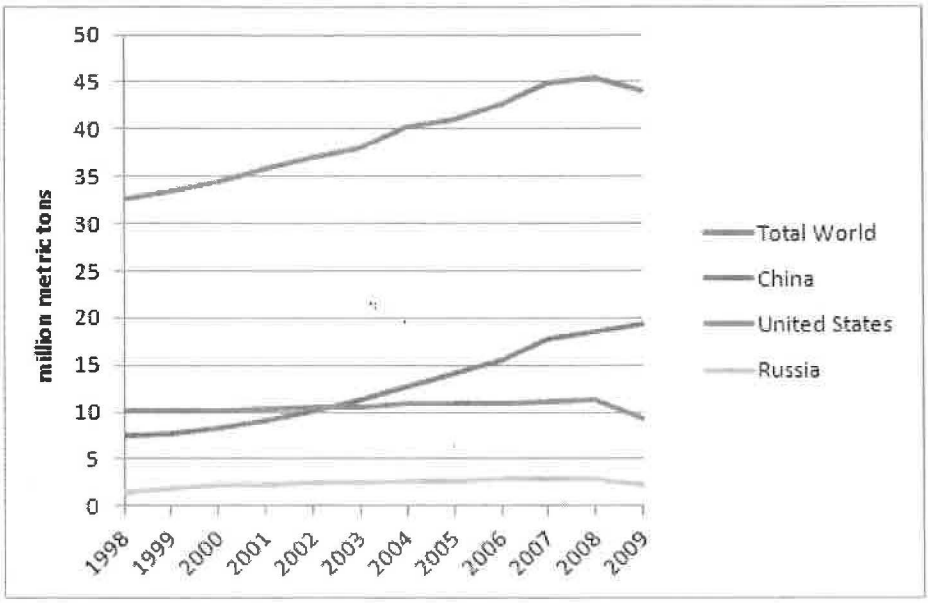
The USGS 2008 Yearbook describes soda ash as a mature commodity in which consumption tends to grow in proportion to population and gross domestic product growth rates. For this reason, the leading customers of soda ash are, for the most part, developed nations with lower growth rates compared with developing countries. The developing nations tend to use less soda ash than developed nations but have higher growth rates. Although the production and consumption quantities vary among the countries, the end-use patterns are basically the same; glass, chemicals, and detergents are the major sectors. Natural soda ash, which comes mainly from the U.S., is much cheaper to produce than synthetic soda ash, making U.S. exports extremely competitive in world markets.

Table 9 – *Soda Ash Production, by Country*, and Figure 7 – *World Soda Ash Production* show soda ash production for the U.S., China and Russia, which together produced 70 percent of the world's soda ash in 2008, 2009 and 2010. World production trended up from 1998 through 2008, dipped in 2009 with the economic slowdown, and reached a new high for 2010. U.S. production has been stable over the past decade, showing a small dip in 2009. Chinese production has increased substantially over this same period. Total world soda ash production was estimated to be 47.5 million metric tons in 2010, up from 44.3 million metric tons in 2009.[22]

Of the 30 countries that produce natural and synthetic soda ash, the U.S. is the world's second leading producer, accounting for 22 percent of total world output for 2010. Total world natural soda ash production represented about 28 percent of combined world soda ash production. Only Botswana, China, Ethiopia, Kenya, and the U.S. produce soda ash from natural sources; the remaining 25 nations manufacture soda ash through various chemical processes.

[22] USGS, 2008 Minerals Yearbook, Soda Ash [Advance Release], Table 7, September 2010.

Figure 7
World Soda Ash Production



Source: USGS Mineral Commodity Summaries.

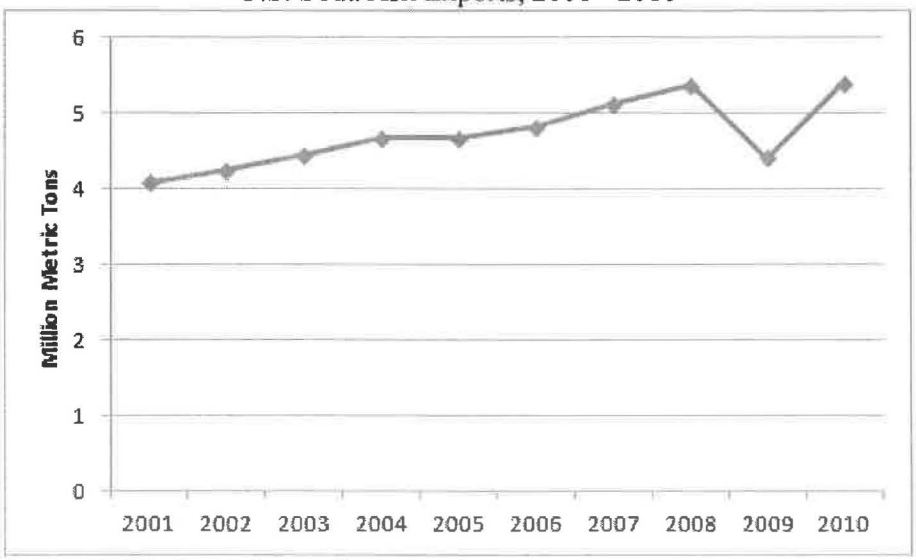
Based on data presented in USGS Mineral Commodity Summaries as shown in Table 8 and Figure 8, U.S. exports of soda ash increased steadily from 4.1 million tons in 2002 up to 5.4 million tons in 2008. In 2006, before the rate reduction U.S. exports were 4.8 million tons. In 2009, exports dropped to 4.4 million tons as a result of the global economic slowdown. In early 2010, the global economic problems continued. The downturn in the residential and commercial construction and automotive industries reduced glass usage, which had a resulting effect on soda ash consumption worldwide. Economic conditions improved in the second half of 2010, and U.S. exports rose to 5.4 million tons. Relative to 2006, exports were 12% higher in 2010.

Table 8
U.S. Soda Ash Exports
(1,000 metric tons)

2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4,090	4,250	4,450	4,670	4,680	4,820	5,130	5,370	4,410	5,400

Source: USGS Mineral Commodity Summaries

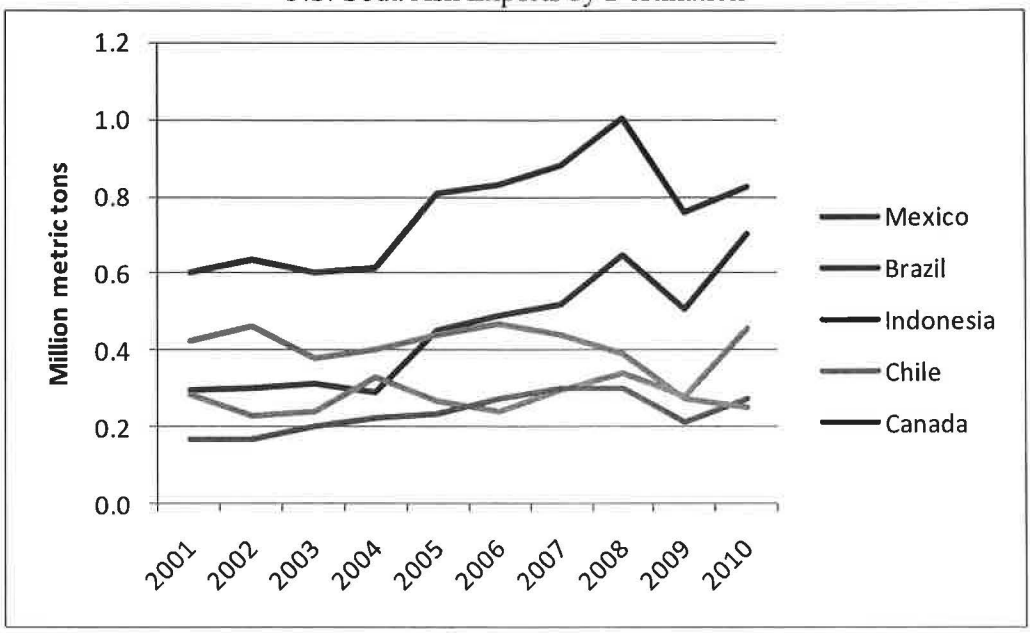
Figure 8
U.S. Soda Ash Exports, 2001 - 2010



Source: USGS Mineral Commodity Summaries

At the same time, direct U.S. exports to China have declined steadily since 2002, dropping to 32,000 metric tons in 2009 and to zero in 2010. However, the majority of exports to Taiwan and Singapore are trans-shipped to China. The major U.S. export markets include Mexico, Brazil, Chile, Indonesia, and Canada. Figure 9 – *U.S. Soda Ash Exports by Destination,* shows U.S. exports by destination for 2001 through 2010.

Figure 9
U.S. Soda Ash Exports by Destination



Source: USGS Mineral Commodity Summaries

On a global scale, Table 10 – *World Soda Ash Exports,* shows world exports by major exporting regions. China's soda ash production, which is mostly synthetic, has been increasing steadily and was about 19.4 million metric tons in 2009.[23] Chinese exports totaled about 2.3 million metric tons in 2009. Exports in 2010 are estimated to be 1.6 million metric tons. About 60 percent of the Chinese exports are sold into markets in Asia and South Asia.

It is not clear from the available data whether the royalty rate reduction instituted by the Act has had any real effect on U.S. exports or on the U.S. position in the global market. Except for 2009, each year's exports have exceeded the 2006 level, following the passage of the Act. Besides the royalty rate reduction, other factors are likely to have had a significant impact on exports, including U.S. producers' cost advantage and their dominant position in the export market, global macroeconomic conditions, and significant soda ash price increases experienced within the time period.

[23] Chinese production has increased as the demand for flat glass has increased.

Table 9
Soda Ash Production, by Country
(1,000 metric tons)

Country	2002	2003	2004	2005	2006	2007	2008	2009	2010
China	10,189	11,336	12,668	14,210	15,600	17,720	18,521	19,350	20,290
US	10,500	10,600	11,000	11,000	11,000	11,100	11,300	9,310	10,600
Russia	2,400	2,400	2,600	2,600	2,800	2,900	2,800	2,300	2,400
India	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
France	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Germany	1,400	1,400	1,400	1,533	2,587	2,595	2,715	2,291	2,539
Poland	1,100	1,050	1,500	1,189	1,177	1,192	1,190	890	1,000
All others	11,487	11,069	11,285	10,545	8,046	7,970	7,689	7,671	8,188
Total World	37,100	38,000	40,300	41,100	43,700	45,900	46,700	44,300	47,500

Source: USGS Mineral Commodity Summaries

Table 10
World Soda Ash Exports, by Region
(1,000 metric tons)

Exporting Region	2005	2006	2007	2008	2009	Share of 2009 World Exports
Europe	2,120.4	2,718.8	2,789.4	2,803.8	2,235.8	22%
Asia	2,087.0	1,971.5	1,813.4	2,221.8	2,459.3	24%
Africa	0.5	155.5	176.1	180.1	242.4	2%
CIS States	1,022.8	1,055.6	1,247.3	1,009.3	713.2	7%
South America	0.0	0.0	0.0	0.0	0.6	0%
Canada	6.7	6.5	6.5	3.6	1.6	0%
U.S.	4,480.5	4,823.7	5,137.9	5,082.7	4,408.7	44%
Total	9,717.9	10,731.5	11,172.8	11,301.3	10,061.6	
US Exports as a percentage of total world exports	46	45	46	45	44	

Source: United Nations, Department of Economic and Social Affairs, Commodity Trade Statistics Database (COMTRADE), http://unstats.un.org/unsd/databases.htm

A major concern identified with exports has to do with supposedly unfair trade practices that protect Chinese producers. The 2010 USGS Mineral Commodity Summary states that the Chinese soda ash industry has received assistance from the government in the form of a 9 percent rebate on Chinese soda ash export sales. However, this represents an incomplete description of the situation. The rebate offered to Chinese exporters can generally be characterized as a type of "border tax adjustment," in this case in the context of a value added tax (VAT). Typically, a VAT border tax adjustment refunds the VAT that would otherwise be paid by the exporter. In this case, the adjustment is partial, as opposed to a full adjustment. The Chinese provide partial adjustments on a variety of products, not just soda ash, that represent a substantial portion of the

value of their exports.[24] However, a border-adjusted VAT will not, as is very commonly believed, enhance international competitiveness, that is, improve a nation's balance of trade.

In order to understand this, it is helpful to imagine adding a destination-based consumption tax to an existing open economy. With respect to exports, the tax would be removed, leaving the relative price of exports to foreign purchasers unaffected. The VAT would be added to imports at the border, making them more expensive in real terms than before but leaving their prices the same relative to comparable domestically produced goods. Thus, a VAT, such as those used by virtually all of the industrialized countries outside the U.S., is in no way the equivalent of the popularly conceived export subsidy with import tariff.[25]

Production internal to China still bears the full VAT, as would imports to China. In this sense, Chinese domestic production and imports compete on the same basis. Imposing a tax on imports and refunding it on exports, which is typically done with a VAT, could appear to create a cost advantage for domestic industries that would in turn improve the balance of trade. However, without changes in other macroeconomic policies, any apparent cost advantage resulting from border tax adjustments would be offset by an adjustment in the exchange rate.[26] In fact, by offering only a partial VAT rebate on exports, China has *disadvantaged* Chinese exporters, and created an incentive to consume taxed items domestically within China.

Customs Districts

Soda ash is exported primarily through the Customs Districts of Columbia-Snake River, Los Angles, Laredo, and Port Arthur. The percentage of soda ash exported through the Columbia-Snake River Customs District has declined from about 57 percent of the total in 2000, to about 40 percent in 2009 (Table 11 – *Percent of Soda Ash Exports by Customs District,* and Figure 10 – *Percent of Soda Ash Exports by Customs District*). At the same time, exports from the Port Arthur District have been steadily increasing, from about 10 percent of the total in 2000 to about 30 percent of total exports in 2009.

The explanation for the shift in export traffic from the Columbia-Snake River District to the Port Arthur District is not clear, but may be partially due to transportation cost advantages associated with shipping to markets in Central and South America. There is nothing in the data or analysis

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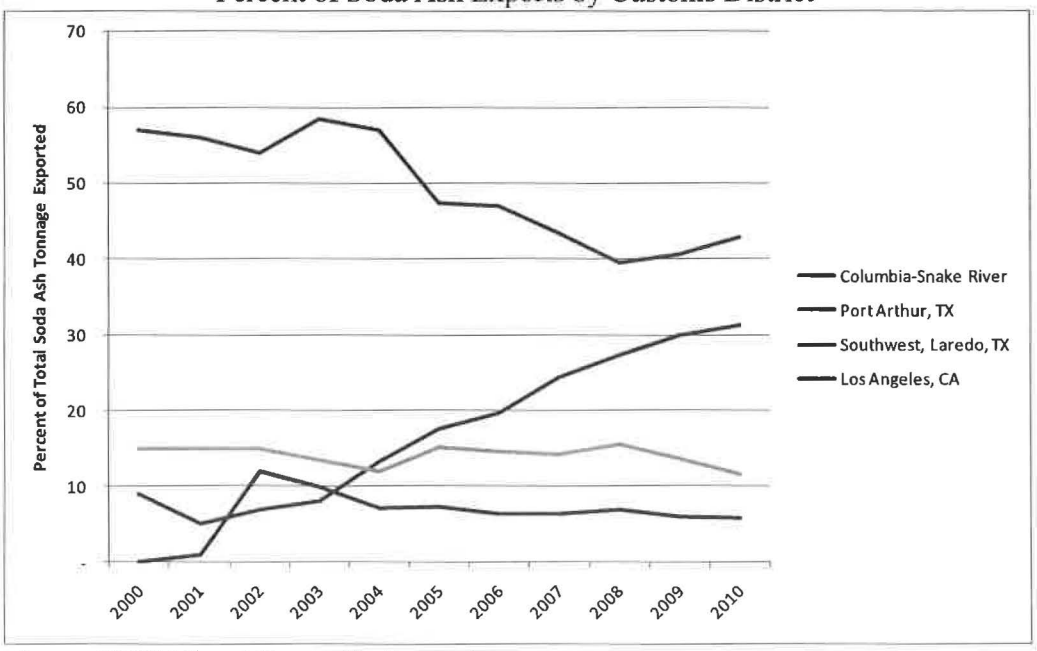
[24] Office of the U.S. Trade Representative (USTR) indicates that there are 3,486 products including textiles, toys, garments, furniture, and some high value-added electrical machinery, representing approximately one quarter of China's total exports that receive some form of VAT export rebate. See: USTR, 2010 National Trade Estimate Report on Foreign Trade Barriers. China, http://www.ustr.gov/about-us/press-office/reports-and-publications/2010.

[25] For additional information see Carroll, R. and Viard, A. "Value Added Tax: Basic Concepts and Unresolved Issues," *Tax Notes*, March 1, 2010.

[26] For example, if a 5 percent destination-based VAT (with border tax adjustments) replaced a 5 percent origin-based VAT (without border tax adjustments), and the domestic price level was unchanged, the border tax adjustments would make imports 5 percent more expensive than domestic goods in domestic markets, and exports 5 percent less expensive than foreign goods in foreign markets. To eliminate the resulting imbalance in foreign currency markets, the value of the domestic currency would have to appreciate 5 percent relative to the value of foreign currencies. The appreciation of the domestic currency would restore the initial terms of trade (the relative prices of imports and exports) without any change in the balance of trade.

that would suggest the royalty rate reduction hastened or slowed this long term shift between these two Customs Districts. However, the port of exit for soda ash exports has significant local and regional ramifications.

Figure 10
Percent of Soda Ash Exports by Customs District



Source: USGS Mineral Commodity Summaries

Table 11
Percent of Soda Ash Exports by Customs District – 2000 to 2010

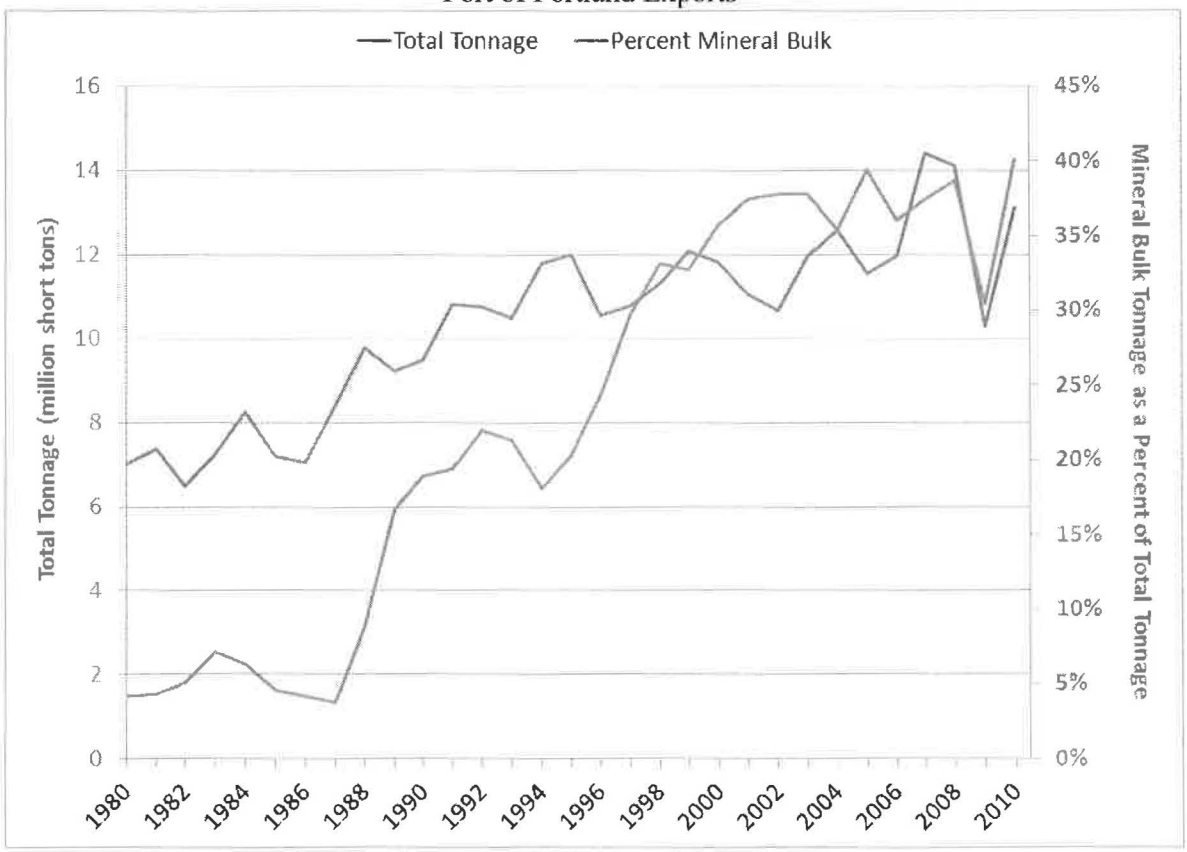
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010[27]
Columbia-Snake River	57.00	56.00	54.00	58.52	56.93	47.45	47.10	43.47	39.5	40.59	42.91
Los Angeles, CA		1.00	12.00	9.91	7.04	7.351	6.31	6.28	6.9	6.05	5.70
Southwest, Laredo, TX	15.00	15.00	15.00	13.47	11.88	15.17	14.56	14.29	15.5	13.56	11.54
Port Arthur, TX	9.00	5.00	6.89	8.01	13.21	17.57	19.67	24.37	27.4	29.93	31.19

Sources: USGS Mineral Commodity Summaries

[27] Estimate.

Although the percentage of soda ash being shipped through the Columbia-Snake River District has been steadily declining, this is not the case for the overall tonnage of material being shipped through some of the ports in the region. For example, the quantity of total tonnage shipped through the Port of Portland has been steadily increasing over the past 30 years. Of the total tonnage shipped through the Port of Portland, mineral bulk commodities had also risen to represent about 40 percent of the total in 2010 (Figure 11 – *Port of Portland Exports*).

Figure 11
Port of Portland Exports



Source: Port of Portland, http://www.portofportland.com/Marine_Stat.aspx

Ultimate Maximum Recovery

The regulations at 43 CFR 3594 cover solid minerals exploration and mining on Federal leases and specifically address the need for mining operations to be conducted in a manner to yield the ultimate maximum recovery of the mineral deposits. The provisions of the Act did not alter this requirement. However, the concern exists that with the significant shifting of production from state leases and private lands onto Federal leases to take advantage of the lower Federal royalty rate, it is possible that the most advantageous geologic and engineering approach to mining out a

deposit may have been compromised. As a result, operations may not be able to achieve the ultimate maximum recovery[28] of the resource.

Summary of Findings and Conclusions

The Act mandates the Secretary report to Congress on the effects of the royalty reduction before the expiration of the 5-year period. Specifically, the report is to document the quantity of sodium compounds and related products produced from Federal leases, the number of jobs created or maintained, and the Federal royalties paid, including those paid to the affected states.

Domestic Production

Since passage of the Act, domestic sodium production and sales have increased. However, by FY 2010, domestic sodium production and sales were only about 1 percent higher than the level in FY 2006. In short, the royalty reduction does not appear to have had a significant impact on the Nation's overall production and sales of sodium compounds and related products.

Production Shifts

Although overall domestic sodium production and sales do not appear to have been significantly affected by the provisions of the Act, there has been a dramatic shift in where the sodium was produced. From FY 2002 through FY 2006, sales from Federal leases accounted for less than 50 percent of the domestic sodium sold each year. By FY 2008, production and sales from Federal leases was 47 percent higher than the year the Act was passed. From FY 2008 through FY 2010, sodium produced from Federal leases accounted for over 60 percent of domestic production.

Most affected by the increase in production from Federal leases was the shift in production away from state leases. In FY 2005, state leases accounted for 14 percent of domestic sales. By FY 2010, state leases accounted for less than 1 percent of total domestic sodium sales.

Sales Revenues

Following passage of the Act, the prices of sodium compounds have experienced dramatic increases. By FY 2009, the domestic weighted average price had peaked at $126.18 per ton, a 41 percent increase over the FY 2006 weighted average price. These price increases were not a result of the royalty rate reduction but they clearly had an effect on sales revenues.

Domestic sales revenues have increased, from $1.1 billion in FY 2006, to $1.4 billion in FY 2007, up to $1.5 billion in FY 2010. By FY 2008, domestic sodium sales revenues from Federal leases were 84 percent higher, just 2 years after passage of the Act. For the 4 years following the royalty rate reduction, sales revenues from Federal leases were $3.5 billion. That figure represents a 150 percent increase in sales revenues from the 4 years before passage of the Act.

[28] 43 CFR 3594.1.

Domestic Employment

Based on USGS data, domestic employment at mines and plants involved in the extraction and processing of soda ash for the past decade has gradually declined. Clearly, the royalty rate reduction did not increase or create jobs in the industry.

However, determining if the provisions of the Act helped maintain employment, that is helped avert layoffs, is more problematic and speculative since employment levels in the industry depend on a number of factors including overall market conditions and employee productivity. This level of analysis is beyond the scope of this report.

Federal Royalty Payments

Royalty payments on sodium sales from Federal leases peaked in FY 2006 at $29.1 million. Since passage of the Act, Federal royalty payments have remained below $20 million per year, despite the dramatic increase in price and sales revenue.

Unrealized Royalty Payments

Using the FY 2006 weighted average royalty rate versus the 2 percent rate mandated by the Act, the royalty payments for FY 2007 through FY 2010 would have been $124.2 million higher. The Department estimates the unrealized royalty payments for FY 2011 will be in the range of $30 to 35 million. This will put the unrealized royalty payments for the 5-year period at over $150 million.

The Congressional Budget Office estimated that the provisions of the Act would reduce total Federal royalty payments by about $30 million. Based on the Department's estimates, the actual effect of the Act will likely be five times the impact anticipated by Congress.

State Royalty Payments

For the FY 2007 through FY 2010 period, the states' portion of the royalties from Federal sodium leases was $34.8 million. The Department estimates the states' portion of the unrealized Federal royalty for FY 2007 through FY 2010 to be $62.1 million. Including FY 2011, the states' portion of the royalties will be over $75 million less than what would have been distributed without the rate reduction.

As a result of production shifting away from state leases and onto Federal leases, royalty revenues from state leases will be over $50 million less for the period FY 2007 through FY 2011.

Industry Capital Investment

Capital investments for the 3 years following the Act were $63.6 million higher than the 3 proceeding years, or about a 20 percent increase. The $159.6 million invested in 2006 represents the high for the period from 2004 through 2009. Since passage of the Act, annual capital

investments have fallen; however, they have remained above the levels reported for 2004 and 2005.

From the industry information presented to the Department, a significant portion of the capital expenditures appear to be intended to maintain or replace existing capacity. As such it is difficult to determine if the increases in capital expenditures were actually to enhance production as intended by the framers of the Act.

World View and U.S. Exports

Despite losing its position as the world's largest producer of soda ash, the U.S. has maintained a dominant position in exports to the global market. Production over the past decade has been stable at around 11 million tons annually. During the recent recession, production dipped to 9.3 million tons for 2009, and rose to 10.6 million tons for 2010.

U.S. exports continue to dominate the world market, accounting for nearly half of all soda ash exported worldwide. For example, U.S. exports made up 44 percent of all world exports in 2009. In contrast, exports for all of Asia (including China and India) accounted for 24 percent of 2009 world exports. U.S. exports dropped from 5.3 million tons in 2008 to 4.4 million tons in 2009, and returned to 5.4 million tons for 2010. The rate of increase in U.S. exports did not appear to change with the royalty reduction, increasing steadily from FY 2002 through FY 2008, then dropping in FY 2009 due to with the global economic downturn. U.S. exports recovered in FY 2010, and were 12.0 percent higher than the export totals for FY 2006.

Customs Districts

Soda ash exports shipped from the Columbia-Snake River Customs District have been declining from 2000 through 2009, while exports from the Port Arthur Customs District have been increasing over the same period. As this shift in traffic began before passage of the Act, it does not appear the royalty rate reduction had an effect on this shift.

Conclusion

The Act resulted in substantial unrealized royalty revenues to the Federal Government and the states which exceeded Congressional estimates. The royalty rate reduction does not appear to have contributed in a significant way to the creation of new jobs within the industry, to increased exports, or to a notable increase in capital expenditures to enhance production. In addition, the royalty rate reduction appears to have influenced a shift of production away from state leases and private lands and onto Federal leases. With regard to global competitiveness, U.S. production has remained stable at around 11 million tons since 2002, with exports stable at around 5 million tons since 2005. U.S. exports continue to account for over 40 percent of total world exports. In contrast, China's production has doubled since 2002, from approximately 10 million to approximately 20 million tons, while Chinese exports remain far below U.S. exports. Since 2002, world-wide production has risen from 37 million tons to 48 million tons in 2010.

Overall domestic employment has not increased since passage of the Act. However, it is not readily apparent from the available data whether jobs have been maintained due to the royalty

rate reduction in the face of the global economic downturn. Any analysis of the number of jobs maintained during the royalty reduction period is highly uncertain; employment levels in the industry depend on a number of factors, such as soda ash market conditions and employee productivity. Productivity gains tend to put downward pressure on the number of employees in the industry, though output has increased in some years. The royalty reduction may have helped slow the recent job losses, though we do not have data to substantiate that possibility.

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