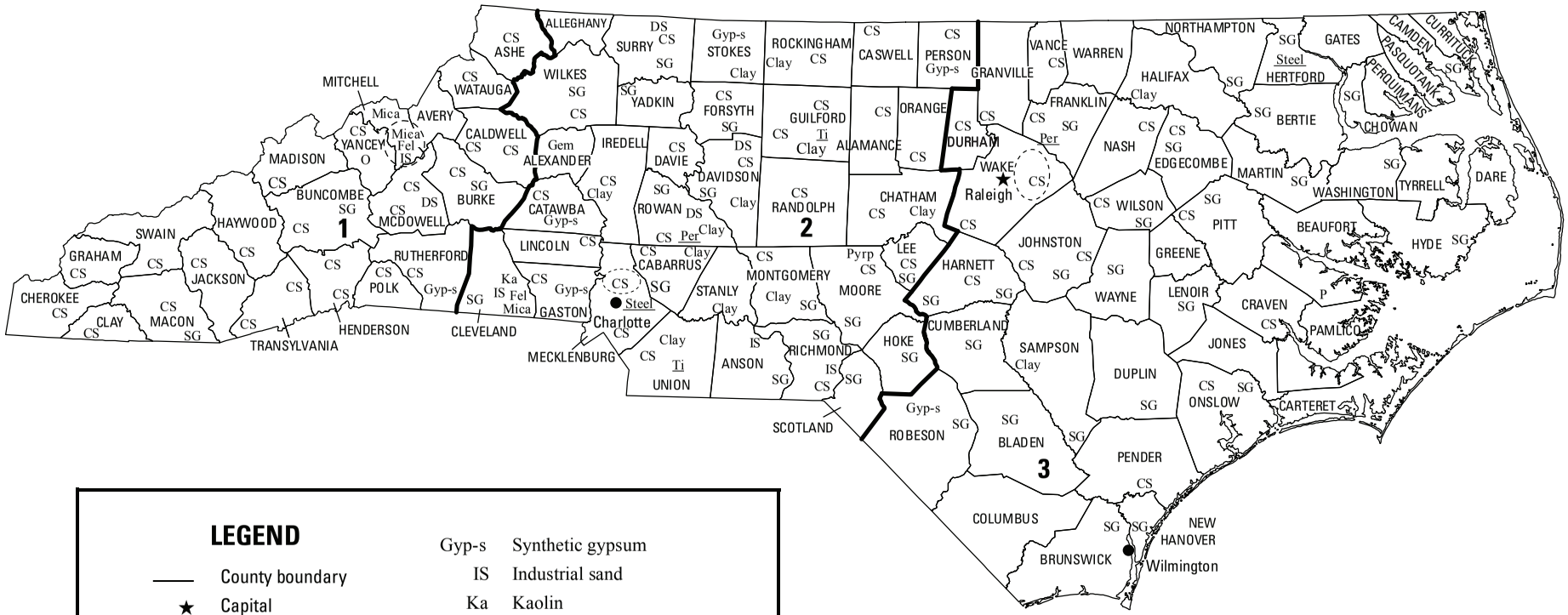
2010–2011 Minerals Yearbook

NORTH CAROLINA [ADVANCE RELEASE]

U.S. Department of the Interior
U.S. Geological Survey

October 2015

NORTH CAROLINA



LEGEND

County boundary

Capital

City

1 Crushed stone and sand and gravel boundary

MINERAL SYMBOLS
(Principal producing areas)

Clay	Common clay
CS	Crushed stone
DS	Dimension stone
Fel	Feldspar
Gem	Gemstones
Gyp-s	Synthetic gypsum
IS	Industrial sand
Ka	Kaolin
Mica	Mica
Per	Perlite plant
P	Phosphate rock
O	Olivine
Pyrp	Pyrophyllite
SG	Construction sand and gravel
Steel	Steel plant
Ti	Titanium metal plant
	Concentration of mineral operations

Source: North Carolina Geological Survey/U.S. Geological Survey (2010–11).

The Mineral Industry of North Carolina

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the North Carolina Geological Survey for collecting information on all nonfuel minerals.

In 2011, North Carolina's nonfuel mineral production[1] was valued at $843 million, based upon annual U.S. Geological Survey (USGS) data. This was a 4.2% decrease from the State's total nonfuel mineral production value of $880 million in 2010, which followed a 3.5% increase from $850 million in 2009. Total production value in the State had exceeded $1 billion from 2006 to 2008. Among the 50 States, North Carolina dropped from 24th in rank for total nonfuel mineral production value in 2009 and 2010 to 25th in 2011. It accounted for approximately 1.2% of the total U.S. value in 2010 and in 2011. On a per capita basis, North Carolina ranked 36th in the Nation in nonfuel mineral production in 2011 with a value of $87; the national average was $240.

As it has been since at least 1986, crushed stone remained the leading nonfuel commodity by value in North Carolina, constituting an average of 70% of the State's total nonfuel mineral production value in 2010–11. It was followed by phosphate rock (percentage withheld— proprietary company data), construction sand and gravel (5%), and industrial sand and gravel (4%). The proportion of North Carolina's total nonfuel mineral production value represented by crushed stone increased from 44% in 1991 to 74% in 2011, with the highest proportion reaching 89% in 2005. Crushed stone has formed at least 60% of the total production value since 1997.

The production values of crushed stone, construction sand and gravel, and industrial sand and gravel increased in both 2010 and 2011. Compared to 2009, the production value of crushed stone increased by $34 million (5.7%) through 2011, while that of construction sand and gravel increased by $3.4 million (7.9%) and industrial sand and gravel by $7.3 million (26%). Industrial sand was the only one of these three mineral commodities to have increased in value despite a drop in quantity produced in 2011; however, it still ended 2011 higher than 2009. The production value of phosphate rock rose in 2010, but then fell in 2011; overall, the production value declined by 30% and the production quantity increased by 10% (values withheld—proprietary company data). Among other nonfuel mineral commodities, the production values of common clay, dimension stone, and olivine each fell in both 2010 and 2011, whereas the production values of gemstones and feldspar increased. The decrease in phosphate rock production value was the primary driver for the decline in North Carolina's total nonfuel mineral production value in 2011.

North Carolina produces a significant number of nonfuel mineral commodities that are not generated in many other States. The State continued to be the only andalusite producer in the Nation during 2010 (but did not produce in 2011) and was also the sole producer of pyrophyllite in 2011. It ranked first out of two States during 2009–10. North Carolina remained first in rank (by quantity) for feldspar production (as it has since 1994) out of seven States, first in olivine out of two States (for the fourth and fifth consecutive years), and second in production of phosphate rock out of four States (as it has since 2005). The State rose to first in mica production out of four producing States in 2010 from second in 2009, then fell to third in 2011. It was also one of only eight States to produce kaolin clay in 2011. Among more common nonfuel minerals, North Carolina remained 3d in the production of common clay (accounting for 6.5% of total U.S. production) and rose to 8th in crushed stone in 2011 from 13th in 2009. The State ended 2011 ranking 2d in gemstones (based upon value, 18% of the U.S. total), 9th in industrial sand and gravel (down slightly from eighth in 2009), and 10th in dimension stone (down from 8th in 2009).

The following narrative information was provided by the North Carolina Geological Survey[2] (NCGS), a State government agency within the Division of Land Resources of the North Carolina Department of Environment and Natural Resources (NCDENR).

Mineral Exploration and Development

Metals

Gold.—Five Canadian junior companies were exploring for gold in the Carolina Slate Belt. Most exploration was in South Carolina but three companies had exploration targets in North Carolina.

Erin Ventures, Inc. worked in the Deep River area, located near the southeastern corner of Randolph County and along the border with Moore County. The prospect consists of about 127 hectares (ha) (313 acres) in 13 private leases. Twelve vertical holes were drilled by Erin; previously, the prospect was explored by Noranda and Cyprus using core holes, saprolite borings, a 90-meter (m) rotary water well, and trenching. An NI 43–101-compliant technical report was issued in February 2011 (Erin Ventures, 2011).

Revolution Resources focused on the Champion Hills Gold Project in Randolph and Davidson Counties, which includes the Earnhardt, Hoover Hill, Jerico Hill, Jones-Keystone, Loflin, and

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All USGS mineral production data published in this chapter are those available as of May 2013. Data in this report are rounded to three significant digits and percentages are calculated from unrounded data. All USGS Mineral Industry Surveys and USGS Minerals Yearbook chapters—mineral commodity, State, and country—can be retrieved over the Internet at http://minerals.usgs.gov/minerals.

[2]Jeffrey C. Reid, Senior Geologist, Industrial and Metallic Minerals, authored the text for the State mineral industry information provided by the North Carolina Geological Survey.

Silver Hill & Silver Valley properties. They drilled at the Jerico Hill, Jones-Keystone, and Loflin properties during 2011. This area was previously explored by Noranda.

Romarco Minerals Inc. was exploring two properties in North Carolina——the Hickory property, formerly named Sawyer Mine, and the Ironwood property, formerly named New Sawyer Mine, both in Randolph County. The company completed an initial 16-hole drill drilling program at Hickory and budgeted for a second phase. At Ironwood, a six-hole program was initiated (Romarco Minerals Inc., 2012).

Strongbow Exploration Inc. focused on the former Parker Gold Mine, located in the Gold Hill mining district. Strongbow completed an eight-hole, 1,400-m drilling program to test for a larger mineralized system beneath historic gold workings; the property had never been drilled before. All eight drill holes encountered narrow zones of weak to moderate silicification and quartz veining, but gold mineralization (ranging from 100 to 9,643 parts per billion gold) was generally restricted to narrow intervals of less than 2.5 m. Because of the general lack of a broad alteration system accompanying gold-bearing quartz veins within the project area, no further work was planned (Strongbow Exploration Inc., 2011).

Lithium.—North Arrow Minerals Inc. conducted a drilling program at its wholly owned Beaverdam lithium project located in Gaston County. The prospect is located in the State's tin-spodumene belt, a historically important lithium-producing region. This area, west of Charlotte, is near lithium-processing and research and development activities for rechargeable lithium-ion batteries for electric vehicles in the United States, including FMC's Lithium Division's Center for Lithium Energy and Advanced Research. The Division's facilities are located about 11 kilometers (km) south of the Beaverdam project.

A total of seven drill holes (1,310 m) were completed during May and June 2010 as part of a program designed to confirm the presence of spodumene pegmatites at depth in the eastern and central portions of the property. The drilling program confirmed the presence of numerous spodumene pegmatites within the Beaverdam property, but additional drilling would be required to define the along strike and down dip continuity of the pegmatite trends identified within the property. Results included intervals containing 1.14% Li_2O over 9.95 m and 1.09% Li_2O over 11.3 m (North Arrow Minerals Inc., 2010).

Rockwood Holdings, Inc. announced that the expansion of its lithium production operation in Kings Mountain was proceeding from preparation to construction. The project was funded in part by a $28.4 million grant from the U.S. Department of Energy to expand and upgrade the production of lithium materials for advanced transportation batteries. The plant was being built at the existing Chemetall Foote Kings Mountain production site. When completed, the expansion would be a state-of-the-art facility to produce battery-grade lithium hydroxide. The site was producing other lithium salts and lithium metal for primary batteries. Previous to the lithium hydroxide expansion project, the company purchased most of the major equipment and began site preparation work. Major civil and mechanical work at the site will begin after issuance of the recently completed environmental assessment. Chemetall Foote is a subsidiary of Rockwood Holdings.

Titanium and Zirconium.—Iluka Minerals was investigating heavy-mineral deposits (ilmenite, rutile and zircon) in Halifax County near Aurelian Springs. In May 2011, Iluka met with county leaders, landowners, and residents and provided a tour of the company's operations in southern Virginia, as a first step in looking into the economic feasibility of establishing a surface mining operation (The Daily Herald, 2011).

Iluka's exploration program consists of an auger on a drill with drill holes from 1.5 to 12 m deep. Samples taken every 0.8 m down hole were panned onsite to estimate the amount of heavy minerals. A percentage of the samples was analyzed at the laboratory in their nearest heavy-mineral operations in Dinwiddie and Sussex Counties, VA, and in Greensville County, VA. Iluka has been mining in the Concord area of Dinwiddie and Sussex Counties since 1988, and the Brink area of nearby Greensville County since 2009.

The heavy minerals of the Upper Coastal Plain of North Carolina and Virginia were described in detail by investigators who estimated quantities at approximately 22.7 million metric tons (Mt) of heavy minerals, at an average grade of 6 weight percent in 377.8 Mt of sand, delineated in 19 deposits in the upper Coastal Plain of North Carolina and Virginia. The deposits formed during a worldwide, Pliocene transgressive-regressive event that took place between 3.5 and 3.0 million years ago. The deposits formed as beach or dune sands during the regressive phase of the event over an elevation range of 96 m to 53 m (Carpenter and Carpenter, 1991).

Tungsten.—Two general inquiries were received about the Hamme Tungsten (Tungsten Queen) Mine located in Vance County and its large tailings pile. The mine tailings are high on the list of tailings piles for North Carolina's Minerals Research Laboratory (MRL) to investigate in coming years for the potential recovery of fluorite, quartz, sulfides including silver ore minerals, and wolframite from the tailings pile, estimated to have at least 3 million tons.

Commodity Review

Industrial Minerals

Aggregates.—Martin Marietta Materials Inc. launched a hostile $4.8 billion offer for larger rival Vulcan Materials Co., as the producers of gravel, sand, and other building materials try to position for a possible upturn in the U.S. construction-and-infrastructure market.

The all-stock offer came after what Martin Marietta executives described as a lengthy effort to negotiate a combination of the two largest U.S. providers of construction aggregates. Together, their mines and quarries have approximately 25 billion metric tons (28 billion short tons) of reserves focused on fast-growing States, such as Georgia, North Carolina, and Texas (Sechler, 2011).

Cement.—Titan America proposed building the country's fourth largest cement plant near Wilmington. It would consist of a cement kiln and an expanded rock quarry. The proposed project was met with opposition by environmental and health activists.

Gemstones.—In 2010, a 64-carat cut emerald known as the "Carolina Emperor" was valued at about $1.5 million. The raw stone, found in Hiddenite, Alexander County in August 2009, weighed 310 carats. This stone was found near the surface at the Adams Farm located about 5 km southwest of the North American Emerald Mines, Inc. property where other large, high-quality emeralds have been found. This area remains an emerging high-quality emerald district of worldwide significance (CNN, 2010; CBS, 2010).

Quartz and Feldspar.—Norsk Mineral AS (Moulde, Norway) and Imerys SA (Paris, France) announced on March 17, 2011, that the two companies had formed a 50–50 joint-venture company called The Quartz Corp, composed of Norsk Mineral's Norwegian Crystallites AS in Norway and Imerys' The Feldspar Corporation and K-T Feldspar Corporation in Spruce Pine, NC (The Quartz Corp., 2011; Hughes, 2013). Since 1996, Norwegian Crystallites AS had been producing high-purity quartz (HPQ) from their Drag plant in northern Norway. The Spruce Pine operations produce feldspar, mica, and quartz products, where the quartz is used as a raw material for the HPQ producers. Norwegian Crystallites had partly been using quartz raw material supplied by Imerys' Spruce Pine operations since 2008. Through The Quartz Corp, the quartz reserves for future HPQ production-capacity expansion were secured, while feldspar and mica would continue to be produced at reduced levels compared to previous years.

Unimin was planning to double HPQ feedstock capacity at its operations in Spruce Pine. Unimin has said that it would invest a "quite substantial" amount on a new flotation plant to complement its existing Schoolhouse facility. Unimin did not comment on capacities or details on the investment. The new plant would feed Unimin's two refinery plants—Red Hill and Crystal—to produce its branded IOTA quartz, which the company exports globally. The three principal markets for Unimin's HPQ are in electronics for semiconductors, the solar market for photovoltaic cells, and applications in the lamp tubing market (Industrial Minerals, 2010).

Sulfur.—PCS Phosphate withdrew its plans to build a sulfur-melting plant at the State port in Morehead City in the face of public opposition. PCS Phosphate now uses a 10-hectare (ha) site at the State port at Morehead City to export products made at the company's operations in Aurora, where it converts molten sulfur into sulfuric acid that is used to make phosphoric acid. Phosphoric acid is a major ingredient in fertilizers, industrial products, and feed for animals. The company now imports molten sulfur to the port and ships it to Aurora, accessible by water to the north in Beaufort County. PCS Phosphate told port officials in March 2010 that it wanted to start melting sulfur in Morehead City.

The Aurora facility had increased efficiency and productivity when its No. 7 Sulfuric Acid plant came online in January 2010. The new plant, which replaced two older sulfuric plants, operated at its designed capacity of 4,080 metric tons per day (4,500 short tons per day). It was also designed to meet or exceed stringent environmental standards, emitting at about half the allowable sulfur dioxide emission rate. In addition, it produces 3,200 metric tons per hour of steam, which has the potential of electrical generating capacity up to 37 megawatts of clean power.

Government Activities and Programs

Carbon Dioxide Sequestration.—The NCGS undertook a preliminary assessment of potential saline aquifers suitable for carbon dioxide (CO_2) sequestration in North Carolina's Coastal Plain (Dare, Tyrrell, and Hyde Counties) of Lower (Early) and Upper (Late) Cretaceous strata from 900 to 1,800 m below sea level. National assessment criteria by the USGS, U.S. Environmental Protection Agency, and the U.S. Department of Energy for CO_2 injection into geologic formations are depths greater than 900 m, and with formation waters having more than 10,000 parts per million (ppm) dissolved solids. Analysis indicates potentially continuous 46- to 50-m-thick sand at a depth of 1,400 to 2,000 m along a coast parallel strike line for 56 km. This sand is above the crystalline basement. An overlying stratigraphic sequence has sand units beginning at a depth of about 1,000 m extending downward to the top of the lower sand. Some structural closure is present, so these sands could be a potential natural gas storage reservoir. Estimated salinities are generally well above the 10,000-ppm criterion. The prime target area, Dare County, is near several large industrial CO_2 emitters (Reid, Depoy, and Taylor, 2012).

Geologic Mapping.—The NCGS continues 1:24,000-scale geologic mapping through the USGS-funded STATEMAP program. Six 1:24,000-scale geologic maps were released in 2010. The completed maps (organized by 1:100,000-scale sheets) are listed below. Most of these geologic maps have limited major- and trace-element whole-rock data. No mineral resource studies (including gold and other metals) were done on these quadrangles, nor were stream sediment geochemical samples taken:

Henderson 1:100,000-scale quadrangle

Bedrock geologic map of the Ingleside 7.5-minute quadrangle, Franklin and Vance Counties, North Carolina, by Edward F. Stoddard. NCGS Open-File Report 2010–05. Scale - 1:24,000. Note: includes extensive granite bodies.

Bedrock geologic map of the Louisburg 7.5-minute quadrangle, Franklin County, North Carolina, by Edward F. Stoddard, Timothy W. Clark, Amanda L.P. Beaudoin, Chris Gilliam, and George Antczak. NCGS Open-File Report 2010–06. Scale - 1:24,000. Note: includes extensive granite bodies.

Geologic map of the North Carolina portion of the John H. Kerr Dam 7.5-minute quadrangle, Warren and Vance Counties, North Carolina, by David E. Blake, Christopher L. Buford, Adam G. Schronce, and David T. Hill. NCGS Open-File Report 2010–01. Scale - 1:24,000. Note: includes portions of the Hamme [Tungsten Queen] district.

Greensboro 1:100,000-scale quadrangle

Geologic map of the Cedar Grove 7.5-minute quadrangle, Person and Caswell Counties, North Carolina, by Heather D. Hanna, Philip J. Bradley, and Norman K. Gay. NCGS Open-File

Report 2010–02. Scale - 1:24,000. Note: includes portions of a major volcanic center.

Geologic map of the Caldwell 7.5-minute quadrangle, Orange and Person Counties, North Carolina, by Philip J. Bradley and Heather D. Hanna. NCGS Open-File Report 2010–03. Scale - 1:24,000. Note: includes portions of a major volcanic center.

Knoxville 1:100,000-scale quadrangle

Bedrock geologic map of the Whittier 7.5-minute quadrangle, North Carolina, by Bart L. Cattanach and G. Nicholas Bozdog. NCGS Open-File Report 2010–04. Scale - 1:24,000. Note: includes portions of landslide prone areas.

Mine Permitting.—The Land Quality Section, Division of Land Resources, North Carolina Department of Environment and Natural Resources administers the Mining Act of 1971 as amended through 2007 through the Mining Program. The Mining Program's Web site is http://portal.ncdenr.org/web/lr/mining. The Web site also has staff contact information, the mine permit application, the Mining Act and Administrative Rules, a link to the NC Mining Commission, and a list of permitted active and inactive mines in North Carolina.

On Forest Service lands, there were two active mineral permits, one for crushed stone in the Cheoah Ranger District, Nantahala National Forest, and one for sand in the Croatan National Forest (Linda Randolph, U.S. Forest Service, written commun., Jeffrey C. Reid, 2011). Sand production in the Nantahala National Forest was very small in quantity. Crushed stone production on the Nantahala Forest operation was moderate.

Natural Gas Assessment.—In 2010, scientists with the NCGS used reports, drilling records, and seismic logs to help identify the potential for significant reserves of natural gas in the Deep River basin near Sanford (Lee, Chatham, and Montgomery Counties). The reddish layers of sandstone and shale have long been mined for brick clay. But a thick, dark organic layer, known as the Cumnock Formation, buried thousands of meters deep, may hold a large amount of natural gas known as shale gas. Unconventional methods of drilling, using horizontal drilling and hydraulic fracturing, would be required to tap into the potential resource. Several natural gas exploration companies have expressed interest, and greater than 3,200 ha have been leased for exploration since January 2010.

The NCGS staff began similar resource investigations in the Durham subbasin (Wake County) and in the Dan River basin (Stokes and Rockingham Counties).

North Carolina State University Minerals Research Laboratory.—During 2010 and 2011, the focus of the MRL continued to be on worldwide-sponsored work for process development of various industrial minerals. Work on phosphate ore, refractory minerals, and silica sands consumed the majority of the lab and pilot plant time. In addition, the lab continued researching possible uses for instate mine tailings. The tailings project was received well by the mining community, with 58 tailings samples from more than a dozen sources analyzed through 2011. The MRL Advisory Council selected feldspar tailings from the Spruce Pine mining district as the main emphasis, followed by the Hamme Tungsten District's Tungsten Queen Mine tungsten, Kings Mountain kaolin, and Nantahala talc and limestone tailings. To facilitate the study of the feldspar tailings, an office was opened in Mitchell County. Various industry specialists along with academics and regulators, advise the MRL personnel on commercial, environmental and technical opportunities for the tailings. Samples of the feldspar tailings were being evaluated for use as a brick additive and for low-iron quartz products. Additional information and contact points for the MRL is at http://mrl.ies.ncsu.edu/ (Carland and others, 2010; Robert Carland, MRL, written commun., Jeffrey C. Reid, 2011).

Rare-Earth Elements.—The USGS published Scientific Investigations Report 2010–5520, "The Principal Rare Earth Elements Deposits of the United States—A Summary of Domestic Deposits and a Global Perspective." It includes an introduction to North Carolina's placer rare-earth element (REE) and a resource assessment.

Additional REE stream-sediment geochemical information is in a series of NCGS bulletins and open-file reports covering the entire State (Reid, 1991; Reid and Carpenter, 1993; Carpenter and Reid, 1993). A crosswalk table between elements and their respective concentration in stream sediments is available at the NCGS Web site to view summary image maps. Individual publications and digital data, including the latitude and longitude of the stream-sediment samples, are available from the NCGS.

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TABLE 1

NONFUEL RAW MINERAL PRODUCTION IN NORTH CAROLINA[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2009		2010		2011	
	Quantity	Value	Quantity	Value	Quantity	Value
Andalusite	W	W	W	W	5,000 [e]	720 [e]
Clays:						
Common	828	4,980	846	4,890	764	4,460
Kaolin	W	W	10	W	10	421
Gemstones, natural	NA	1,260 [r]	NA	1,950	NA	1,990
Mica, crude	W	W	W	W	W	W
Sand and gravel:						
Construction	7,680 [r]	43,600 [r]	8,260	46,500 [r]	8,140	47,000
Industrial	1,300	28,000	1,400	30,900	1,330	35,300
Stone:						
Crushed	38,700 [r]	587,000 [r]	40,600	592,000 [r]	42,500	621,000
Dimension	62	22,300	58	20,700 [r]	59	11,600
Combined values of feldspar, olivine, phosphate rock, pyrophyllite (crude), and values indicated by symbol W	XX	163,000 [r]	XX	183,000	XX	121,000
Total	XX	850,000 [r]	XX	880,000	XX	843,000

[e]Estimated. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data. Withheld values included in "Combined values" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2

NORTH CAROLINA: CRUSHED STONE SOLD OR USED IN THE UNITED STATES, BY TYPE[1]

Type	2009				2010				2011			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	14 [r]	4,060 [r]	$59,200 [r]	$14.58	12	3,910	$56,700	$14.52	12	3,890	$55,300	$14.21
Dolomite	--	--	--	--	1	301	4,240	14.09	1	290	4,200	14.49
Granite	85 [r]	28,600 [r]	435,000 [r]	15.21	90	28,300	413,000	14.63	91	29,900	437,000	14.61
Traprock	7	4,290	66,300	15.46	8	5,330	77,200	14.48	8	5,460	81,100	14.85
Slate	--	--	--	--	2	516	7,250	14.06	2	514	7,350	14.30
Miscellaneous stone	7	1,810	26,300	14.53	6	2,240	32,700	14.62	7	2,450	36,200	14.75
Total or average	XX	38,700 [r]	587,000 [r]	15.17	XX	40,600	592,000	14.59	XX	42,500	621,000	14.61

[r]Revised. XX Not applicable.

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

TABLE 3
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 2010, BY USE[1]

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Riprap and jetty stone	148	3,930
Filter stone	111	2,470
Other coarse aggregate	W	W
Coarse aggregate, graded:		
Concrete aggregate, coarse	809	12,200
Bituminous aggregate, coarse	W	W
Bituminous surface-treatment aggregate	W	W
Railroad ballast	251	3,990
Other graded coarse aggregate	3,510	63,000
Fine aggregate (-⅜ inch):		
Stone sand, concrete	W	W
Stone sand, bituminous mix or seal	W	W
Screening, undesignated	721	9,470
Other fine aggregate	W	W
Coarse and fine aggregates:		
Graded road base or subbase	1,490	20,000
Unpaved road surface	W	W
Terrazzo and exposed aggregate	W	W
Crusher run or fill or waste	920	11,500
Other coarse and fine aggregates	4,220	58,500
Agricultural, poultry grit and mineral food	W	W
Special, whiting or whiting substitute	98	3,030
Other miscellaneous uses and specified uses not listed	W	W
Unspecified:[2]		
Reported	21,600	305,000
Estimated	4,100	58,800
Total	40,600	592,000

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Reported and estimated production without a breakdown by end use.

TABLE 4
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS
IN 2011, BY USE[1]

(Thousand metric tons and thousand dollars)

Use	Quantity	Value
Construction:		
Coarse aggregate (+1½ inch):		
Macadam	W	W
Riprap and jetty stone	132	1,870
Filter stone	W	W
Unspecified coarse aggregate	W	W
Coarse aggregate, graded:		
Concrete aggregate, coarse	W	W
Bituminous aggregate, coarse	W	W
Bituminous surface-treatment aggregate	W	W
Railroad ballast	354	4,830
Unspecified graded coarse aggregate	W	W
Fine aggregate (-⅜ inch):		
Stone sand, bituminous mix or seal	W	W
Screening, undesignated	592	7,650
Unspecified fine aggregate	W	W
Coarse and fine aggregates:		
Graded road base or subbase	1,240	19,000
Crusher run or fill or waste	1,030	12,500
Unspecified coarse and fine aggregates	W	W
Special, other fillers or extenders	16	236
Other miscellaneous uses and specified uses not listed	347	4,580
Unspecified:[2]		
Reported	24,200	348,000
Estimated	5,430	78,400
Total	42,500	621,000

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Reported and estimated production without a breakdown by end use.

TABLE 5
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2010, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[2]	164	3,250	W	W	W	W
Coarse aggregate, graded[3]	1,290	22,600	W	W	1,450	27,700
Fine aggregate (-⅜ inch)[4]	496	6,920	W	W	W	W
Coarse and fine aggregates[5]	1,620	22,800	W	W	3,210	43,300
Agricultural[6]	2	86	--	--	--	--
Special[7]	98	3,030	--	--	--	--
Other miscellaneous uses and specified uses not listed[8]	--	--	W	W	--	--
Unspecified:[9]						
Reported	423	6,430	10,400	147,000	10,800	152,000
Estimated	2,890	41,000	1,150	16,700	57	1,130
Total[10]	6,980	106,000	17,200	250,000	16,400	236,000

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes macadam, riprap and jetty stone, filter stone, and other coarse aggregates.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregates.
[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregates.
[5]Includes graded road base or subbase, unpaved road surface, terrazzo and exposed aggregate, crusher run, roofing granules, and other coarse and fine aggregates.
[6]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[7]Includes mine dusting or acid water treatment, whiting or whitening substance, and other fillers or extenders.
[8]Includes drain fields, waste material, lightweight aggregate (slate), pipe bedding, refractory stone (including ganister), and other miscellaneous uses.
[9]Reported and estimated production without a breakdown by end use.
[10]District totals may not add up to the published State total, owing to revisions made after the production of the table and (or) proprietary data being withheld.

TABLE 6
NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2011, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction:						
Coarse aggregate (+1½ inch)[2]	W	W	W	W	W	W
Coarse aggregate, graded[3]	W	W	W	W	W	W
Fine aggregate (-⅜ inch)[4]	433	5,900	W	W	W	W
Coarse and fine aggregates[5]	1,210	17,300	W	W	W	W
Special[6]	16	236	--	--	--	--
Other miscellaneous uses and specified uses not listed[7]	--	--	W	W	--	--
Unspecified:[8]						
Reported	453	6,450	W	W	13,500	194,000
Estimated	2,750	39,500	1,060	15,400	1,620	23,500
Total	6,180	91,400	17,600	255,000	18,700	274,000

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes macadam, riprap and jetty stone, filter stone, and other coarse aggregates.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregates.
[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregates.
[5]Includes graded road base or subbase, unpaved road surface, terrazzo and exposed aggregate, crusher run, roofing granules, and other coarse and fine aggregates.
[6]Includes mine dusting or acid water treatment, whiting or whitening substance, and other fillers or extenders.
[7]Includes drain fields, waste material, lightweight aggregate (slate), pipe bedding, refractory stone (including ganister), and other miscellaneous uses.
[8]Reported and estimated production without a breakdown by end use.

TABLE 7
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2010,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	2,690	$16,800	$6.25
Plaster and gunite sands	192	$703	$3.66
Concrete products (blocks, bricks, pipe, decorative, etc.)	150	1,110	7.40
Asphaltic concrete aggregates and road base materials[2]	440	2,090	4.75
Fill	1,330	3,990	3.00
Other miscellaneous uses[3]	99	2,060	20.81
Unspecified:[4]			
Reported	735	4,800	6.53
Estimated	2,490	14,100	5.66
Total or average	8,260	46,500	5.63

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Includes filtration, golf course, and snow and ice control.
[4]Reported and estimated production without a breakdown by end use.

TABLE 8
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2011,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate (including concrete sand)	2,820	17,600	$6.24
Concrete products (blocks, bricks, pipe, decorative, etc.)[2]	33	465	14.09
Asphaltic concrete aggregates and road base materials[3]	1,240	6,710	5.41
Fill	973	3,300	3.39
Other miscellaneous uses[4]	78	799	10.24
Unspecified:[5]			
Reported	738	5,780	7.83
Estimated	2,250	12,400	5.51
Total or average	8,140	47,000	5.77

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes golf course, and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.

TABLE 9
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2010,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products[2]	W	W	1,120	5,990	W	W
Asphaltic concrete aggregates and road base materials[3]	W	W	150	922	W	W
Fill	7	60	134	445	1,190	3,480
Other miscellaneous uses[4]	1	14	71	1,800	27	248
Unspecified:[5]						
Reported	--	--	12	49	722	4,750
Estimated	527	2,990	320	2,070	1,640	9,080
Total[6]	563	3,560	1,810	11,300	5,750	30,900

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes filtration, golf course, and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.
[6]District totals may not add up to the published State total, owing to revisions made after the production of the table and (or) proprietary data being withheld.

TABLE 10
NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2011,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates and concrete products[2]	W	W	893	5,420	W	W
Asphaltic concrete aggregates and road base materials[3]	W	W	289	2,780	W	W
Fill	4	48	65	204	905	3,050
Other miscellaneous uses[4]	1	8	22	203	55	588
Unspecified:[5]						
Reported	11	65	6	27	721	5,690
Estimated	523	3,080	382	1,520	1,350	7,770
Total	556	3,570	1,660	10,200	5,930	33,300

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes golf course, and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.