

# Mineral Industry Surveys

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## NICKEL IN SEPTEMBER 2002

In September, reported domestic nickel consumption on a daily average basis was 3% less than that of August, according to the U.S. Geological Survey. Average daily nickel consumption of cathode, pellets, briquets, and ferronickel for stainless steel was 84.7 metric tons per day (t/d)—7% greater than the 79.3 t/d for August, but 3% less than the 87.6 t/d (revised) for September 2001. Consumption of elemental nickel to make nickel-base corrosion-resistant alloys was 5% greater than the corresponding tonnage reported for August. The 5% increase for corrosion-resistant alloys was more than offset by a 24% decrease in consumption for copper-nickel alloys. Sales to plating companies averaged 28.6 t/d, about 14% less than the August sales figure. Total consumption for the first 9 months of 2002 was down 14% from the 66,400 t reported for the corresponding period of 2001.

On September 30, U.S. consumer stocks of cathode, pellets, briquets, and powder totaled 2,250 t—20% more than the 1,870 t for August 31 and 13% more than the 1,990 t reported for yearend 2001. Stocks in London Metal Exchange (LME) warehouses worldwide totaled 21,030 t—3% less than the tonnage on August 31. LME stocks were 134% greater than on March 31, 2001, when they bottomed out at 9,000 t after a 16-month slide. Preliminary data collected by the International Nickel Study Group indicated that, at the end of August 2002, world nickel producers (excluding those in Austria, China, the former Yugoslavia, and the Ural area of Russia) had approximately 86,700 t of nickel in primary products in stock, of which 60,800 t or 70% were Class I materials. Class I materials are refined products with a nickel (Ni) content of 99% or greater (electrolytic cathode, pellets, briquets, rondelles, powder, etc.). Class II materials include ferronickel, oxide sinter, and East Asian utility nickel—products with a Ni content less than 99%.

Percentages reported in the above paragraphs may not be verifiable owing to concealment of individual company proprietary data and late reporting of data.

The United States imported 81,300 t of primary nickel in the first 8 months of 2002, 11% less than the 91,800 t for the corresponding period of 2001. Class I materials accounted for

86% of total primary imports received during the first 8 months of 2002. Trade data for September 2002 will appear in a subsequent report.

### Inco undertakes comprehensive review of Goro Project

On December 5, Inco Limited announced that it was slowing key engineering and construction work on its Goro Project in the French Overseas Territory of New Caledonia (Hand and Goudie, 2002<sup>§</sup>; Platts Metals Week, 2002). Inco's management, concerned about rising estimates of Goro's capital costs, has begun a comprehensive review of the entire nickel-cobalt project. In September, Inco officials became wary when updated cost data and trend information from the company's contractors indicated that the projected capital cost of Goro had increased by at least 15%—rising from \$1.45 billion to \$1.67 billion. Inco has spent about \$350 million on the project to date, and has signed contracts committing an additional \$300-to-\$350 million for equipment and services. Inco was hoping to complete the comprehensive review by mid-2003 (Inco Limited, 2002a, b).

Inco was prepared to slow the construction schedule so that any design changes needed to ensure the economic viability of Goro could be incorporated at an early stage. The cost estimate increases were attributed to unforeseen geotechnical problems and evolving design requirements based on feedback from onsite pilot-plant work. The mining and hydrometallurgical processing complex had been scheduled to begin production in late 2004.

According to company officials, Goro has 54 million metric tons of proven and probable reserves, making the orebody one of the larger undeveloped laterite deposits in the world. The lateritic ore averages 1.53% Ni and 0.12% cobalt (Co). Additional resources are expected to extend the life of the mine far beyond its planned 20 years. The mining and processing complex would produce 55,000 metric tons per year (t/yr) of Ni

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<sup>§</sup>A reference that includes a section twist (§) is found in the Internet Reference Cited section.

in nickel oxide and 4,500 t/yr of Co in cobalt carbonate. The project is a joint venture of Inco (85% equity) and Bureau de Recherches Géologiques et Minières (BRGM), a French Government agency (15%). A Japanese consortium led by Sumitomo Metal Mining Co., Ltd., has been negotiating to acquire a 25% interest in Goro. BRGM was considering selling its 15% share to Inco.

### **References Cited**

Inco Limited, 2002a, Inco Limited provides update on nickel demand for 2002 and its Goro and Voisey's Bay projects and financial position: Toronto,

Ontario, Inco Limited press release IN 27/02, October 10, 2 p.  
Inco Limited, 2002b, Inco Limited to undertake comprehensive review of Goro project based on latest cost data and trends: Toronto, Ontario, Inco Limited press release IN 30/02, December 5, 2 p.  
Platts Metals Week., 2002, Goro Nickel cost overruns mount; delayed for months: Platts Metals Week, v. 73, no. 49, December 9, p. 1, 6.

### **Internet Reference Cited**

Hand, Scott, and Goudie, Peter, 2002 (December 13), Goro conference call and webcast, accessed December 18, 2002, at URL [www.inco.com/investorinfo/presentations/conference.asp](http://www.inco.com/investorinfo/presentations/conference.asp).

TABLE 1  
CONSUMPTION OF NICKEL (EXCLUSIVE OF SCRAP), BY FORM AND USE 1/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total	Total year to date
2001:					
September	5,460	1,090	187	6,730	66,400
October	5,490	757	160	6,410	72,800
November	5,000	608	323	5,930	78,700
December	4,460	537	215	5,210	83,900
January-December	71,300	10,100	2,500	83,900	XX
2002:					
January	5,080	774	292	6,150	6,150
February	5,000	890	281	6,170	12,300
March	5,030	723	375	6,130	18,500
April	5,370	879	286	6,540	25,000
May	5,030	722	87	5,840	30,800
June	5,450	873	261	6,580	37,400
July	5,500	730	272	6,500	43,900
August	5,580	843	236	6,660	50,600
September:					
Steel:					
Stainless and heat resisting	1,790	754	W	2,540	22,000
Alloy (excludes stainless)	W	--	W	W	2,350
Superalloys	1,190	--	W	1,190	10,900
Copper-nickel alloys	W	--	--	W	W
Electric, magnetic, and expansion alloys	11	--	--	11	97
Other nickel & nickel alloys	W	--	W	W	W
Cast iron	W	--	--	W	W
Electroplating (sales to platers)	858	--	--	858	8,600
Chemical and chemical uses	W	--	--	W	W
Other uses	1,580	--	65	1,650	12,900
Total reported	5,430 2/	754	65	6,250	56,800
Total all companies (calc) 3/	XX	XX	XX	8,910	81,000
2002: January-September	47,500	7,190	2,160	56,800	XX
2001: January-September	56,400	8,230	1,800	66,400	XX

W Withheld to avoid disclosing company proprietary data; included in "Other uses" category. XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Of consumption, 4,340 metric tons were consumed as cathodes and pellets, the remainder as briquets and powder.

3/ Figures represent calculated apparent consumption; based on the revised proportion of reported primary consumption (70.11%) to apparent primary consumption for 2000.

TABLE 2  
ENDING STOCKS OF NICKEL (EXCLUSIVE OF SCRAP) HELD BY CONSUMERS, BY FORM AND USE 1/ 2/

(Metric tons, nickel content)

Period	Cathodes, pellets, briquets, and powder	Ferronickel	Oxide-sinter, salts, and other forms	Total
2001:				
September	2,500	309	102	2,910
October	2,770	391	226	3,390
November	2,480	330	198	3,010
December	1,990	522	289	2,800
2002:				
January	1,800	832	282	2,920
February	2,110	454	106	2,670
March	2,230	152	134	2,510
April	2,490	513	94	3,100
May	2,250	82	127	2,460
June	1,840	63	138	2,040
July	1,580	98	98	1,780
August	1,870	112	84	2,070
September:				
Steel (stainless, heat resisting and alloy)	726	89	(3/)	815
Nonferrous alloys 4/	1,510	--	(3/)	1,510
Foundry (cast irons)	(3/)	--	(3/)	(3/)
Chemical (catalysts, ceramics, plating salts, etc.) and unspecified uses	19	--	78	97
Total	2,250	89	78	2,420

-- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Stocks held by companies that consume nickel in more than one end-use category are credited to the major category. Stocks are subject to revisions owing to inventory adjustment.

3/ Included in the "Chemical and unspecified uses" category.

4/ Includes superalloys, nickel-copper and copper-nickel alloys, permanent magnet alloys, and other nickel alloys.

TABLE 3  
CONSUMPTION AND ENDING STOCKS OF PURCHASED SECONDARY NICKEL, BY USE 1/

(Metric tons, nickel content)

Period	Consumption			Stocks		
	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap	Ferrous scrap 2/	Nonferrous scrap 3/	Total scrap
2001:						
September	5,590	751	6,340	3,030	105	3,140
October	5,150	1,540	6,690	3,170	100	3,270
November	3,970	829	4,790	3,330	92	3,420
December	3,950	784	4,730	3,750	93	3,840
January-December	55,000 r/	11,300 r/	66,400 r/	XX	XX	XX
2002:						
January	4,940	784	5,720	3,180	86	3,270
February	4,920	810	5,730	3,070	88	3,160
March	5,050	767	5,810	2,960	102	3,060
April	5,190	740	5,930	2,980	109	3,090
May	5,020	620	5,640	3,690	97	3,790
June	6,340	549	6,890	3,340	103	3,440
July	5,950	713	6,660	3,320	97	3,410
August	6,140	685 r/	6,830	3,110	105	3,210
September	4,820	621	5,440	3,400	110	3,510
2002- January-September	48,400	6,290	54,700	XX	XX	XX
2001- January-September	42,000	8,180	50,200	XX	XX	XX

r/ Revised. XX Not applicable.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Nickel content is calculated from an average nickel content and the reported gross weight of scrap.

3/ Combined consumption and stocks of aluminum-base, copper-base, and nickel-base scrap.

TABLE 4  
U.S. IMPORTS FOR CONSUMPTION OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content) 2/

Period and country of origin	Cathodes, pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date 4/	Wrought nickel
2001:										
August	6,510	1,100	1,790	16	569	352	176	10,500	98,200	82
September	7,980	438	1,080	120	238	294	202	10,400	109,000	156
October	11,200	617	160	263	434	265	279	13,200	122,000	142
November	9,160	434	1,330	162	429	174	322	12,000	134,000	54
December	8,360	640	707	188	344	193	276	10,700	144,000	95
January-December	111,000	8,310	11,600	1,350	5,580	3,180	3,200	144,000	XX	1,140
2002:										
January	6,550	597	446	400	443	283	244	8,960	8,960	74
February	11,900	428	620	128	341	235	235	13,900	22,900	109
March	5,760	813	679	54	315	275	277	8,180	31,000	30
April	6,220	551	983	--	221	349	274	8,590	39,600	116
May	6,600	590	1,240	14	222	478	297	9,450	49,100	53
June	8,950	391	1,160	238	174	460	228	11,600	60,700	43
July	11,800	627	1,080	214	367	874	225	15,200	75,900	69
August:										
Australia	1,050	20	--	--	--	--	--	1,070	6,990	--
Brazil	--	--	--	--	--	--	--	--	678	--
Canada	4,240	390	--	127	47	572	--	5,380	40,400	--
Colombia	--	--	451	--	--	2	--	453	1,720	--
Dominican Republic	--	--	981	--	--	--	--	981	4,250	--
Finland	370	94	--	--	--	--	21	485	2,810	--
France	--	--	--	--	17	--	18	35	1,590	30
Germany	220 5/	12	--	--	17	--	48	297	988	9
Japan	--	1	--	(6/)	1	1	49	52	358	5
Mexico	--	--	--	--	--	168	1	169	826	--
New Caledonia	--	--	--	--	--	--	--	--	300	--
Norway	1,490	--	--	--	8	--	--	1,500	6,130	--
Russia	189	76	57	--	--	--	--	322	16,000	--
South Africa	40	--	--	--	--	--	--	40	258	--
Sweden	--	1	--	--	--	--	--	1	38	--
United Kingdom	4	8	--	--	47	--	3	62	708	(6/)
Venezuela	--	--	298	--	--	13	--	311	1,380	--
Zimbabwe	132	--	--	--	--	--	--	132	849	--
Other	18 5/	--	--	--	15	6	31	70	1,040	28
Total	7,750	602	1,790	127	152	762	171	11,400	87,200	72
2002: January-August	65,600	4,600	8,000	1,180	2,230	3,710	1,950	87,200	XX	568
2001: January-August	74,500	6,180	8,320	614	4,140	2,250	2,120	98,200	XX	688

XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide, and hydroxide (65%).

3/ Excludes wrought nickel.

4/ May include revisions for prior months.

5/ All or part of these data have been referred to the Census Bureau for verification.

6/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 5  
U.S. EXPORTS OF NICKEL, BY COUNTRY 1/

(Metric tons, nickel content) 2/

Period and country of destination	Cathodes, pellets, and briquets	Powder and flakes	Ferro-nickel	Metal-lurgical-grade oxide	Waste and scrap	Stainless steel scrap	Chemicals	Total 3/	Total year to date	Wrought nickel
2001:										
August	90	108	11	205	1,160	1,600	224	3,400	41,100	116
September	156	115	1	161	1,030	1,970	178	3,610	44,800	151
October	170	90	14	142	1,740	2,680	346	5,180	49,900	177
November	158	85	--	132	1,100	1,350	148	2,970	52,900	124
December	125	72	(4/)	131	1,290	2,310	198	4,130	57,000	163
January-December	1,400	1,380	50	1,940	15,700	32,900	3,680	57,000	XX	2,400
2002:										
January	344	135	6	122	1,110	1,030	233	2,990	2,990	192
February	170	81	3	152	989	3,720	229	5,350	8,330	167
March	245	151	(4/)	64	1,470	2,040	219	4,190	12,500	262
April	187	113	--	67	1,280	3,890	226	5,770	18,300	139
May	65	119	10	111	1,360	1,900	213	3,780	22,100	271
June	105	134	(4/)	19	1,550	2,500	155	4,470	26,500	283
July	131	140	1	9	1,560	2,040	204	4,080	30,600	200
August:										
Australia	--	(4/)	--	--	--	--	--	(4/)	81	--
Belgium	--	1	--	--	--	2	2	5	302	--
Canada	22	57	--	40	674	238	35	1,070	10,200	6
China	--	20	1	--	--	672	7	700	3,500	1
France	(4/)	31	--	--	--	3	--	34	280	56
Germany	12	6	--	--	(4/)	3	5	26	771	(4/)
India	--	--	--	--	--	66	8	74	782	--
Italy	--	14	--	--	--	1	11	26	46	(4/)
Japan	--	10	--	(4/)	72	41	6	129	1,450	1
Korea, Republic of	1	4	--	--	10	125	31	171	6,060	2
Mexico	39	1	--	2	1	6	12	61	1,190	139
Netherlands	--	31	--	--	--	--	7	38	649	(4/)
South Africa	--	--	--	--	9	--	--	9	21	--
Spain	3	--	--	--	--	--	--	3	676	11
Sweden	--	--	--	--	32	5	--	37	479	--
Taiwan	--	(4/)	--	--	--	306	7	313	5,700	(4/)
United Kingdom	--	1	--	--	16	2	(4/)	19	398	10
Other	--	46	--	--	12	35	37	130	900	4
Total	77	222	1	42	826	1,510	168	2,840	33,400	230
2002: January-August	1,320	1,090	22	587	10,100	18,600	1,650	33,400	XX	1,740
2001: January-August	792	1,020	35	1,370	10,600	24,600	2,810	41,100	XX	1,790

XX Not applicable. --- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ The nickel contents are assumed to be as follows: metallurgical-grade oxide (77%), waste and scrap (50%), and stainless steel scrap (7.5%). The chemical category includes chlorides (25%), sulfates (22%), and other salts (22%), supported catalysts (22%), and oxide, sesquioxide, and hydroxide (65%).

3/ Excludes wrought nickel.

4/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 6  
U.S. IMPORTS FOR CONSUMPTION OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of origin	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2001:									
August	520	308	318	203	(2/)	148	159	1,660	14,300
September	357	161	247	202	(2/)	193	129	1,290	15,600
October	321	271	452	312	1	234	182	1,770	17,300
November	341	268	467	122	(2/)	153	143	1,490	18,800
December	350	354	342	300	1	140	126	1,610	20,400
January-December	4,110	3,860	5,030	3,070	15	2,600	1,770	20,400	XX
2002:									
January	353	231	399	329	--	203	155	1,670	1,670
February	183	177	408	227	1	248	154	1,400	3,070
March	256	207	407	293	(2/)	327	159	1,650	4,720
April	390	229	531	254	(2/)	233	151	1,790	6,510
May	179	248	456	289	1	337	162	1,670	8,180
June	232	294	401	287	15	511	122	1,860	10,000
July	133	259	624	361	31	124	196	1,730	11,800
August:									
Australia	73	--	--	--	--	--	--	73	860
Belgium	--	--	(2/)	--	--	4	(2/)	4	112
Canada	--	--	2	--	--	2	4	8	173
China	--	--	3	--	--	--	19	22	180
France	--	2	97	6	--	7	1	113	830
Germany	--	96	123	278	34	128	28	687	4,670
Italy	--	105	2	--	--	5	(2/)	112	569
Japan	8	--	3	(2/)	--	8	1	20	1,330
Mexico	--	--	--	--	--	--	95	95	652
Netherlands	--	--	--	--	--	--	3	3	46
South Africa	23	--	--	--	--	--	--	23	255
Sweden	--	--	80	1	--	8	--	89	1,740
United Kingdom	60	12	17	71	--	17	3	180	1,390
Other	6	2	33	(2/)	(2/)	(2/)	7	48	426
Total	170	217	360	356	34	179	161	1,480	13,200
2002: January-August	1,900	1,860	3,580	2,400	83	2,160	1,260	13,200	XX
2001: January-August	2,740	2,800	3,520	2,130	13	1,880	1,190	14,300	XX

XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 7  
U.S. EXPORTS OF NICKEL ALLOYS, BY COUNTRY 1/

(Metric tons, gross weight)

Period and country of destination	Unwrought alloyed ingot	Bars, rods, and profiles	Wire	Plates and sheets	Foil	Tubes and pipes	Other alloyed articles	Total	Total year to date
2001:									
August	1,240	642	165	548	5	129	354	3,080	23,100
September	1,610	667	97	543	6	155	390	3,470	26,600
October	1,300	601	171	770	13	107	950	3,920	30,500
November	1,190	641	135	623	23	124	333	3,070	33,600
December	954	591	82	404	7	164	160	2,360	36,000
January-December	13,400	7,890	1,660	7,030	146	1,900	3,970	36,000	XX
2002:									
January	861	599	93	572	9	134	247	2,520	2,520
February	808	600	106	596	43	115	340	2,610	5,120
March	884	626	178	505	11	197	653	3,050	8,180
April	618	451	96	476	12	204	278	2,130	10,300
May	862	495	99	638	32	136	297	2,560	12,900
June	1,070	393	142	567	8	127	363	2,670	15,500
July	437	518	91	392	8	144	307	1,900	17,400
August:									
Australia	72	--	(2/)	--	--	--	3	75	540
Belgium	--	50	2	16	--	1	12	81	1,180
Canada	3	33	8	21	4	31	44	144	1,890
France	102	72	(2/)	31	(2/)	--	7	212	2,870
Germany	523	27	6	20	(2/)	5	16	597	2,420
India	--	--	1	4	(2/)	(2/)	7	12	86
Ireland	--	--	(2/)	1	--	(2/)	(2/)	1	37
Italy	60	(2/)	18	47	--	(2/)	6	131	1,010
Japan	(2/)	7	1	72	--	1	3	84	660
Korea, Republic of	19	18	(2/)	54	--	(2/)	(2/)	91	456
Mexico	(2/)	7	79	1	1	66	167	321	2,110
Netherlands	9	--	--	6	--	(2/)	2	17	51
Singapore	4	2	1	--	--	1	1	9	113
Spain	(2/)	(2/)	--	--	--	1	1	2	45
Sweden	--	71	(2/)	2	--	--	(2/)	73	267
Switzerland	17	1	(2/)	20	(2/)	(2/)	11	49	493
Taiwan	10	--	(2/)	1	--	3	2	16	256
United Kingdom	114	178	4	178	(2/)	5	14	493	3,170
Other	18	61	22	71	10	14	130	326	2,510
Total	951	527	142	545	15	128	426	2,730	20,200
2002: January-August	6,490	4,210	950	4,290	137	1,190	2,910	20,200	XX
2001: January-August	8,310	5,390	1,180	4,690	97	1,350	2,130	23,100	XX

XX Not applicable. -- Zero.

1/ Data are rounded to no more than three significant digits; may not add to totals shown.

2/ Less than 1/2 unit.

Source: U.S. Census Bureau.

TABLE 8  
NICKEL CONSUMPTION IN CAST AND WROUGHT PRODUCTS

	Percent	
	Wrought	Cast
September 2002:		
Stainless and heat resisting steels	71	29
Alloy steels	99	1
Superalloys	82	18
Copper-nickel alloys	97	3
Other nickel-base alloys	100	(1/)

1/ Less than 1/2 unit.

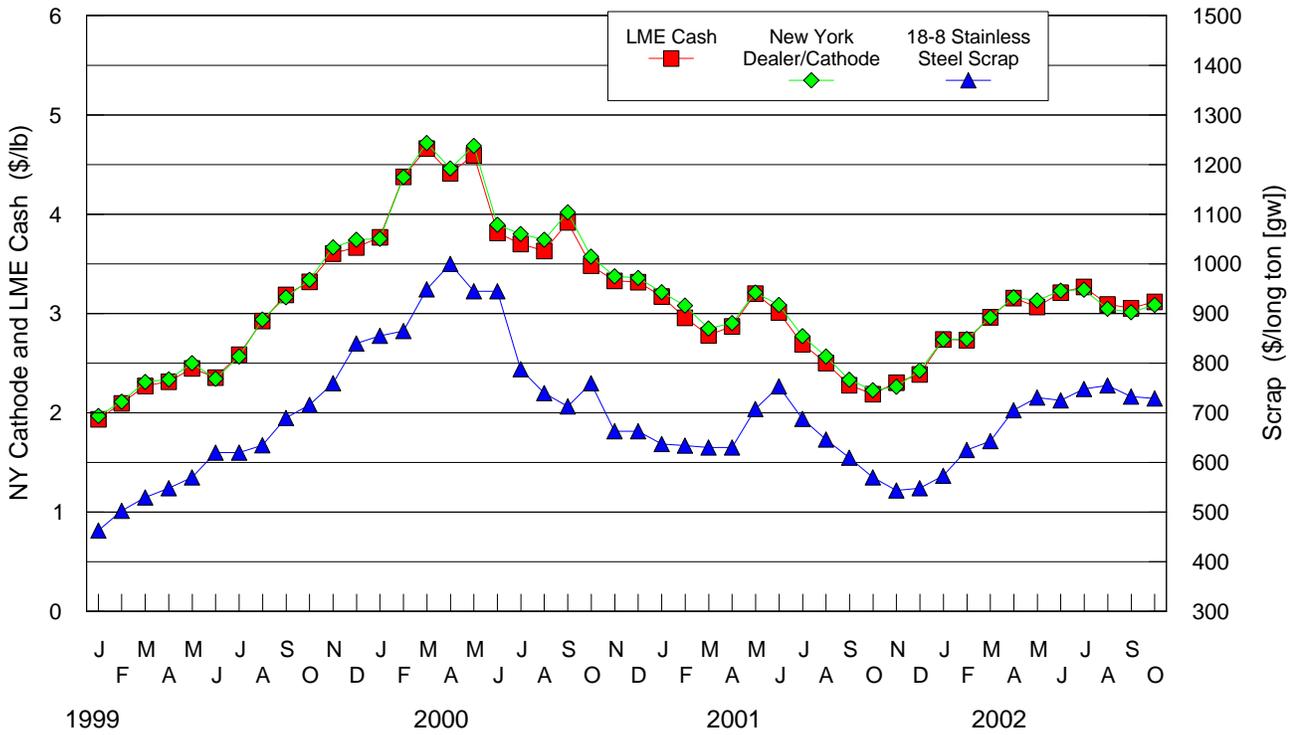
TABLE 9  
NICKEL PRICES

Date	Cathode	LME	LME	18/8 Stainless
	NY Dealer	Cash	Cash	steel scrap
	\$/lb.	\$/t	\$/lb.	Pittsburgh
				\$/long ton(gw)
2002:				
Average for week ending:				
September 6	3.09-3.16	6,650.500	3.017	720-745
September 13	3.10-3.33	6,901.500	3.130	720-745
September 20	3.07-3.25	6,622.500	3.004	720-745
September 27	2.95-3.08	6,425.500	2.915	720-745
October 4	3.02-3.15	6,569.500	2.980	720-745
October 11	3.04-3.09	6,530.000	2.962	720-735
October 18	3.01-3.21	6,704.500	3.041	720-735
October 25	3.19-3.31	7,003.500	3.177	720-735
Average for month of:				
January	2.736	6,043.182	2.741	573
February	2.745	6,029.250	2.735	625
March	2.963	6,537.500	2.965	643
April	3.163	6,958.214	3.156	705
May	3.130	6,761.364	3.067	731
June	3.213	7,119.861	3.230	725
July	3.268	7,142.717	3.240	748
August	3.094	6,717.143	3.047	755
September	3.053	6,640.238	3.012	733
October	3.118	6,804.457	3.086	729

Source: Platts Metals Week and American Metal Market.

# 1999-2002 AVERAGE MONTHLY PRICES

(Derived from Metals Week and American Metal Market quotations)



# 1999-2002 STOCKS

