WORLD EXPLORATION TRENDS 2012

A Special Report from Metals Economics Group for the PDAC International Convention

MEG Metals Economics Group

WORLDWIDE EXPLORATION TRENDS

Nonferrous exploration more than doubles in just two years

Metals Economics Group's (MEG) 22nd edition of *Corporate Exploration Strategies* (CES) concludes the industry's aggregate budget for nonferrous metals exploration surged to $18.2 billion in 2011[1]. Despite periods of weakness and volatility, metals prices—the primary driver of exploration spending— have improved significantly since bottoming in early 2009, and have remained well above their long-term trends through 2010-11. Almost all companies have responded by increasing their exploration budgets over the past two years. As a result, the industry's aggregate exploration total jumped 44% in 2010 and a further 50% in 2011, more than doubling from 2009's recent low of $8.4 billion to the new all-time high of $18.2 billion in 2011.

1 Metals Economics Group obtains the data used in our CES series of studies through the generous cooperation of the companies we survey. The individual exploration budgets covered by the study include spending for gold, base metals, platinum group metals, diamonds, uranium, silver, rare earths, potash/phosphate, and many other hard-rock metals, but specifically exclude exploration budgets for iron ore, coal, aluminum, oil and gas, and many industrial minerals.

(All figures are reported in U.S. dollars; all historical exploration figures throughout this report represent dollars of the day and have not been inflation adjusted.)

The PDAC is pleased to partner with Metals Economics Group in making this special report on global exploration and industry trends available to our members and Convention 2012 delegates. The PDAC makes use of Metals Economics Group's services to better understand global exploration trends, thereby helping us to support our members through the development of programs and policy recommendations. Metals Economics Group is acknowledged as the leader in providing comprehensive information, expertise, and analysis to the mining industry, and is the premier source for exploration statistics worldwide.
*— **Ross Gallinger, Executive Director, PDAC***

BASIS FOR ESTIMATED NONFERROUS EXPLORATION TOTAL

MEG's 2011 exploration estimate is based on information collected from almost 3,500 mining and exploration companies worldwide, of which more than 2,400 had exploration budgets reported in the *Corporate Exploration Strategies* (CES) study. These companies (each budgeting at least $100,000) together allocated $17.25 billion for nonferrous exploration, which we estimate covers about 95% of worldwide commercially oriented nonferrous exploration spending. Adding our estimates of budgets that we could not obtain, the 2011 worldwide exploration total reached $18.2 billion.

Although iron ore exploration remains outside the scope of the CES and is not included in the analysis throughout the remainder of this report, we asked the companies we surveyed in 2011 for the total amount they were budgeting for ferrous activity above and beyond the core targets the CES covers in detail. Including the allocations of a number of pure iron ore producers and explorers that were not otherwise part of this study, we were able to aggregate a total budget of about $1.84 billion for iron ore in 2011. Although our coverage of iron ore explorers is not as comprehensive as it is for other commodities, we believe the budgets of these companies represent a significant share of the 2011 iron ore exploration total. If we include an estimate for budgets we did not obtain, the 2011 iron ore exploration total was likely more than $2.5 billion.

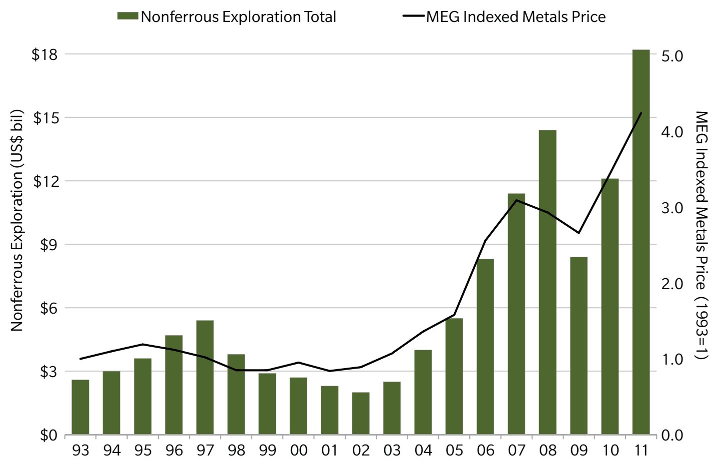
SUMMARY OF OVERALL TRENDS

Figure 1 shows MEG's estimate of annual nonferrous exploration allocations since the early 1990s relative to a weighted metals price index. The graph indicates the cyclical nature of exploration investment and the correlation between metals price trends and exploration spending. From the bottom of the cycle in 2002, the steep rise in metals prices led to successive budget increases by the majors and meteoric budget increases by the juniors, pushing the industry's exploration total to a new high of $14.4 billion in 2008—an increase of 620% from 2002.

The boom years came to an abrupt halt in September 2008 as the world fell into the worst economic downturn in decades. Widespread forecasts of a deep and protracted global recession painted a grim outlook for near-term global commodities demand, pushed most metals prices into steep decline, and forced the great majority of companies to slash their 2009 exploration plans. The resulting $6 billion (42%) drop in exploration spending from 2008's high was the largest year-on-year decline (in both dollar and percentage terms) since MEG began the CES in 1989.

After bottoming in early 2009, the industry recovered much more quickly than predicted, and the global economy improved markedly over the course of 2009 and 2010, before a mixed 2011. Metals prices also improved significantly since bottoming in early 2009, and despite periods of weakness and volatility, remained well above their long-term trends through 2010-11. Almost all companies increased their exploration budgets in response to rising metals prices over the past two years. As a result, the industry's aggregate exploration total jumped 44% in 2010 and a further 50% in 2011, more than doubling from 2009's recent low of $8.4 billion to a new all-time high of $18.2 billion in 2011.

Figure 1: Estimated Global Nonferrous Exploration Budget Totals, 1993-2011



Source: Corporate Exploration Strategies

DRILLING EXPANDS, BUT AVERAGE PORTFOLIO DOESN'T

Table 1 lists the number of CES survey respondents that provided additional metrics over and above their 2011 exploration budgets, showing the 2011 average and average change from 2010. Although there is a wide variation in the scale of exploration programs by major, intermediate, and junior companies, looking at the overall averages by comparable companies allows us to make year-on-year generalizations.

Following the collapse of budgets and drill programs in 2009, the increased budgets over the past two years have translated into significantly larger drill programs. Most companies with comparable figures planned significantly more drilling in 2011 than in 2010, adding an average of 14,000 m—a 41% increase among companies with comparable information. However, the average increase in drilling lags behind the aggregate budget increase by this same group of companies (almost 51%), likely due to rising drilling costs, an increased focus on other exploration techniques, or some combination of these and other factors.

When we compare the number of projects and overall area held for exploration, the average portfolio of assets in the industry appears to have changed little, with comparable companies increasing their number of projects by less than 4% without adding land to the overall area held for exploration. This does not suggest that the companies with comparable data hold the same portfolio that they did a year ago, but simply that the net change in the overall size of the average portfolio was negligible. Using the industry averages, the typical exploration portfolio in 2011 consisted of five projects, each of which covered about 570 km^2, received a budget of $1.8 million, and underwent about 6,800 m of drilling.

As their exploration budgets and drill programs have grown, many explorers also face a return to the labor shortages that plagued the industry during the boom years of 2006 through early 2008. Despite the often-reported shortage of experienced geoscientists, most companies increased their exploration groups in 2011. Major and intermediate companies with comparable information hired on average nine and four new geoscientists respectively, although staffing increases among the juniors were marginal (only one more geoscientist for every three companies). Collectively, exploration companies with comparable data added about 14% more geoscientists to their payroll in 2011 (including both field and office-based), and budgeted an average of $1.1 million and 3,500 m of drilling for each geoscientist.

Table 1: Other Exploration Metrics[2] of Major, Intermediate, and Junior Companies, 2011

Amount of Exploration Drilling Planned	***Total***
# of Companies	564
Avg Amount of Drilling Planned (m)	34,163
Avg Change from 2010* (m)	13,969
Avg Budget/Planned Meter (US$)	$288.4
Active Exploration Projects	
# of Companies	683
Avg # of Projects	5
Avg Change from 2010*	0.2
Avg Budget/Project (US$ mil)	$1.8
Area Held for Exploration	
# of Companies	594
Avg Area Held (km^2)	2,847
Avg Change from 2010* (km^2)	1.0
Avg Budget/km2 (US$)	$2,929.6
Exploration Geoscientists	
# of Companies	532
Avg # of Geoscientists	8
Avg Change from 2010*	1.4
Avg Budget/Geoscientist (US$ mil)	$1.4

*Average change by the companies that reported comparable information in 2010 and 2011.

Source: Corporate Exploration Strategies

2 As part of MEG's annual exploration survey, we ask companies to quantify a number of exploration metrics, including the number of geoscientists/geologists employed by their exploration department (both field and office-based); the number of projects being explored; the approximate area held for exploration; and the amount of drilling planned for the year. Although the response rate to this part of our survey is lower than the 2,400 companies for which we were able to quantify exploration budgets, the results do allow us to make year-on-year generalizations among the different company classifications.

EXPLORATION EXPENDITURES RISE IN ALL REGIONS

Exploration allocations for all regions[3] increased to record highs in 2011, led by the largest dollar increases in Latin America and Africa. Latin America remained the most popular exploration destination, attracting 25% of global spending in 2011, with six countries—Mexico, Chile, Peru, Brazil, Colombia, and Argentina—accounting for the lion's share of the region's total. Buoyed by strong growth in gold exploration in Colombia, Guyana, Brazil, and Mexico, the share of allocations targeting gold in Latin America increased in 2011, while base metals slipped to its smallest share in more than a decade.

Canada has been the industry's second favorite region for the past decade, and continued to take advantage of its large pool of junior explorers and exploration-focused tax incentives to attract 18% of the global total in 2011. Three provinces—Ontario, Quebec, and British Columbia—accounted for more than 60% of the planned Canadian nonferrous exploration spending. Gold remained the leading target in the country, attracting more than two–and-a-half times the base metals budget.

Eurasian countries make up the third largest region, led by allocations for China and Russia, and by four other countries—Kazakhstan, Mongolia, Finland, and Turkey—that each attracted aggregate budgets of more than $100 million in 2011. Although gold remained the region's top target in 2011, base metals allocations increased at a faster pace due to rapidly growing copper and nickel budgets for Kazakhstan, Russia, China, and Poland.

Africa saw the biggest year-on-year percentage increase of all regions in 2011, claiming 15% of the world total and widening its lead over fifth-place Australia. After slipping to second place in 2010 behind the Democratic Republic of Congo, South Africa regained the top spot for planned spending in Africa in 2011. Burkina Faso rose from twelfth in 2009 to third in 2011, leading the rapid rise in gold exploration in West Africa in recent years. The increased efforts in West Africa translated into gold receiving more than half the African exploration total in each of the last two years; in contrast, since accounting for about a third of African budgets in 2004, diamond allocations dropped to an all-time low of 6% in 2011, primarily due to waning diamond spending in Sub-Saharan Africa, as many companies focus more in countries such as Russia and India.

Exploration spending in Australia kept pace with the world average increase in 2011, maintaining the country's share of the total at about 13%, despite mining reform at both the national and state levels dominating the country's headlines for much of the year. Spending in Western Australia accounted for almost half the country's 2011 nonferrous exploration total, while South Australia saw the largest year-on-year percentage increase. Gold and base metals accounted for the bulk of Australia's 2011 exploration total, with allocations for diamonds, uranium, platinum group metals, and other targets trailing by wide margins.

Gold and copper exploration in the United States kept it in sixth place

3 The annual budget totals for Canada, Australia, and the United States are typically much larger than for most other countries; as a result, MEG also treats these countries as regions in its CES studies.

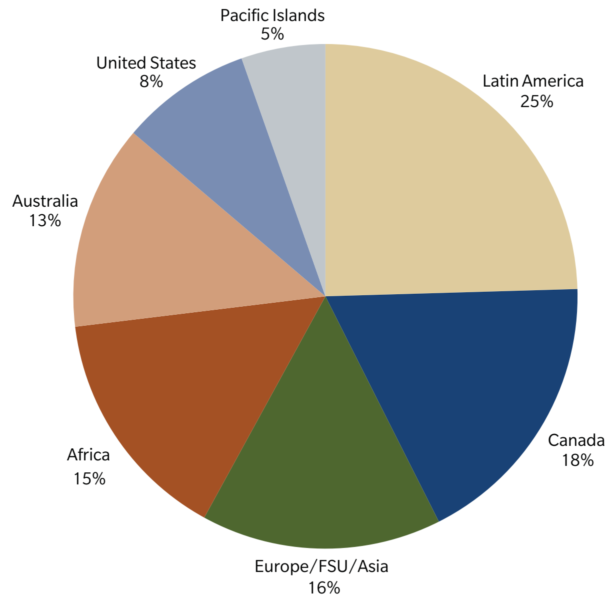
regionally, ahead of the Pacific Islands. Nevada had the largest share of the country's 2011 exploration total, and three states—Nevada, Arizona, and Alaska—accounted for almost two-thirds of the country's total. Although gold continued to attract more than half of all spending in the United States, base metals reached its second-highest percentage share in the past decade, based in part on increased copper exploration in Arizona and Utah.

Among the Pacific Islands, allocations for Papua New Guinea, Indonesia, and the Philippines accounted for the bulk of the region's 5% of the world exploration total, with budgets fairly evenly split between gold and base metals. Despite the region's high prospectivity for gold, copper, and nickel, investors continued to be wary of the political and social unrest, uncertainty of tenure, and periodic antimining violence that have plagued the region for years. As a result, we have not seen a lot of new entrants into these countries in recent years, with most exploration conducted by larger producers in and around their existing assets.

RISK TOLERANCE RISES WITH EXPLORATION SPENDING

Most countries saw increased exploration investment in 2011, and explorers demonstrated a higher tolerance for risk despite additional concerns and uncertainty about security, policy, taxation, and tenure in many countries. Of the 121 countries for which we documented exploration spending by the industry in 2011, those commonly perceived to be high risk accounted for 23% of the 2011 aggregate exploration total, up from less than 15% in 2010. The potential reward of working in higher-risk areas often increases the industry's appetite for risk during periods of increased exploration spending, but exploration in high-risk countries, particularly early-stage work, is usually the first to be cut when risk levels or uncertainty increase.

Figure 2: Global Nonferrous Exploration Budgets by Region, 2011



Source: Corporate Exploration Strategies

Figure 3: Top Destinations for Nonferrous Exploration, 2011

Source: Corporate Exploration Strategies

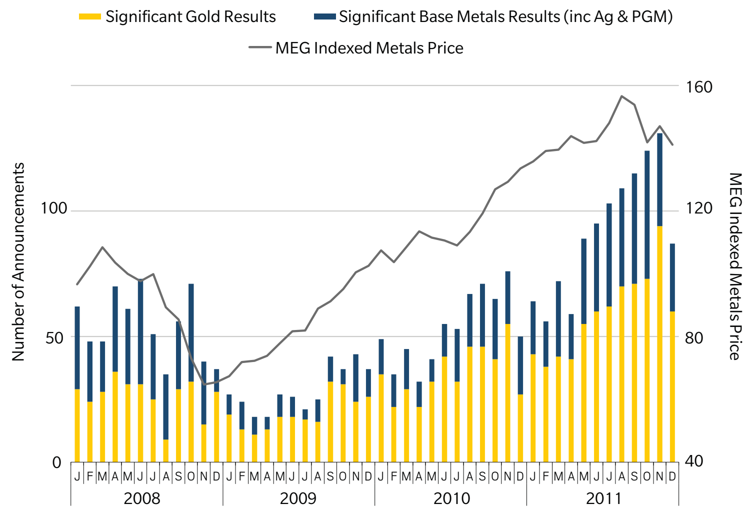
Other locations account for about 6%

SIGNIFICANT DRILLING SURGES, WITH INCREASED BUDGETS

Fueled by surging commodities prices, and an accompanying increased availability of risk capital, junior and intermediate companies embarked on unprecedented exploration spending in 2011. Significant drill announcements[4] by these companies followed suit, increasing 73% over 2010's total and hitting new four-year highs between May and November. Compared with the lows of late 2008 and early 2009, when most companies avoided risk and focused their exploration dollars on their existing, more advanced deposits, 2011 saw a rebound in the number of initial finds, new zones, and satellite deposits, as well as from work on expanding existing resources.

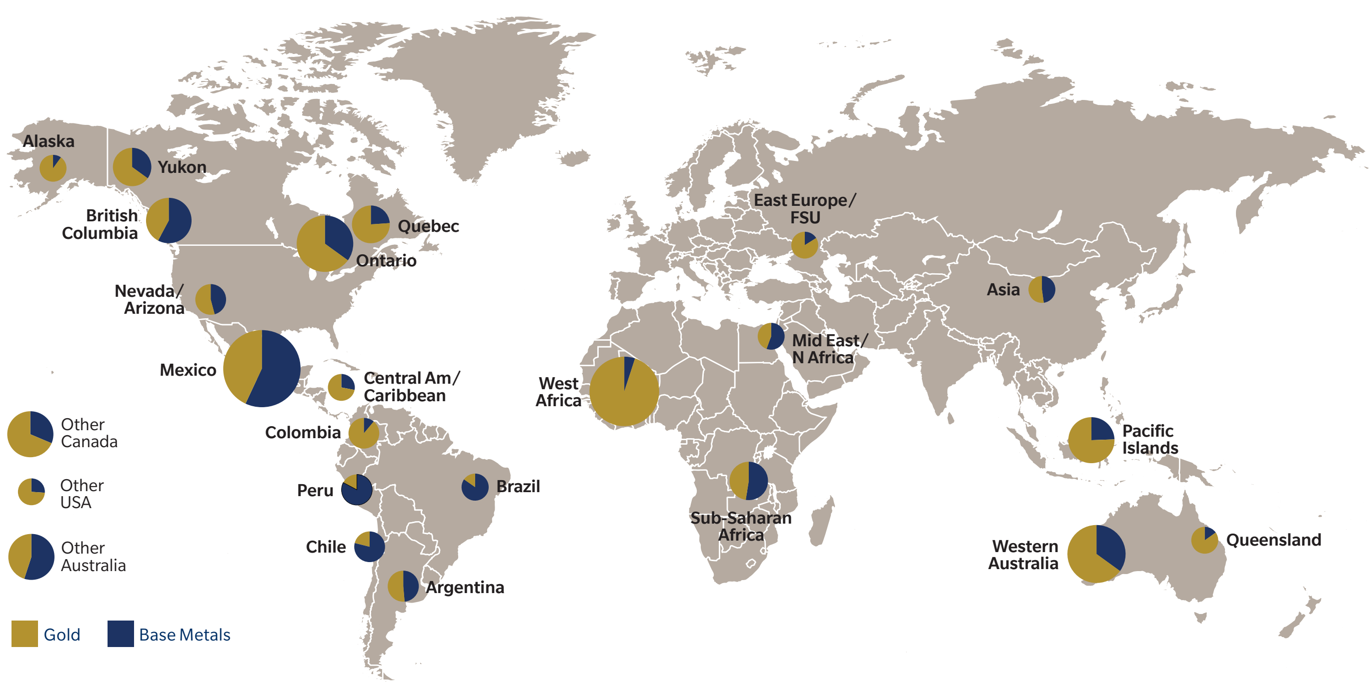
Gold, copper, and silver accounted for 92% of the significant precious and base metals drill results in 2011. The regional distribution of results illustrated in the map below shows good levels of success in West Africa and Colombia (gold), the Andean regions of South America (copper), and Mexico (silver). Canada and Australia—home to, and popular exploration destinations for, many of the world's junior explorers—also had very good numbers for both gold and base metals, exemplifying the value of ease of access to prospective land—both geographically and politically. The relative lack of significant results throughout mainland Asia—considered some of the most prospective and underexplored terrain on the globe—demonstrates that regardless of geology, many publicly-listed juniors are still hesitant to seriously explore in countries that historically have not protected their long-term interests.

Figure 4: Significant Gold and Base Metals Drill Results Announced[4], 2008-11



Source: Industry Monitor, Exploration Activity Service

Figure 5: Location of Significant Gold and Base Metals Drill Results Announced[4], 2011



Source: Industry Monitor, Exploration Activity Service

4 MEG's Industry Monitor uses our Exploration Activity Services to track significant precious and base metals drill results monthly since 2008. Significant drilling includes initial finds, new zones or satellite deposits, and extensions to existing mineralization—essentially any drilling that adds to the resource potential of a particular project or deposit. For this section, and in the Industry Monitor service, silver and PGM results are included with the base metals (copper, nickel, zinc-lead, molybdenum, and cobalt) to allow a clear picture of the unique trends in gold exploration.

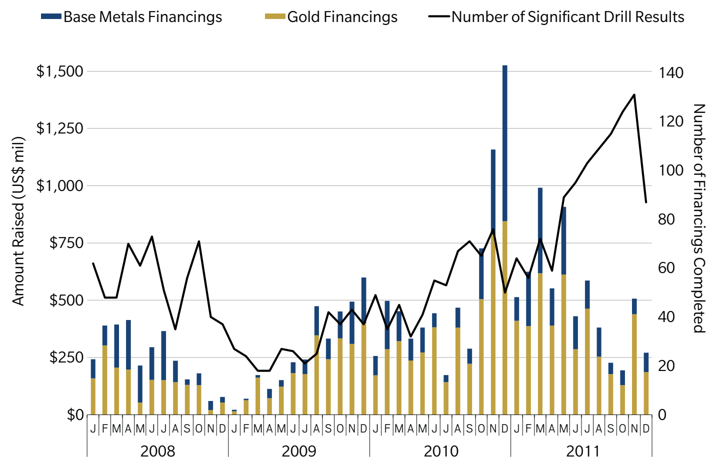
DECLINE IN EQUITY MARKETS PRESENTS OPPORTUNITIES

With risk capital-dependent junior companies accounting for close to half of annual exploration spending in recent years, the state of equity markets plays a key role in shaping trends and strategies in the exploration industry from year to year. Strong market conditions enabled junior explorers to raise a combined $7.4 billion for precious and base metals exploration[5] in the final quarter of 2010 and the first half of 2011. Despite reports of drill rig shortages and assay lab backlogs in some key exploration regions, significant drill results trended strongly upward for most of 2011.

Equity markets then struggled in the second half of 2011, and the pace of exploration financings fell back to the levels of late 2009 and early 2010. Since most of the money a junior spends on exploration in a given year is typically raised between the fourth quarter of the previous year and the middle of the current year, if equity markets fail to improve in the first half of 2012, many juniors may have trouble raising the necessary funds to sustain or increase exploration spending in 2012. In contrast, intermediate and major producers with healthy balance sheets are likely to intensify their efforts to replace reserves by increasing their exploration allocations in 2012. If this scenario plays out in the coming months, the juniors' share of overall exploration spending in 2012 will decline.

These conditions—historically strong commodity prices, resource-hungry miners with strong balance sheets, and a relative shortage of available risk capital—can create interesting opportunities for the exploration industry. Juniors with promising projects at current and long-term metals prices, but with insufficient access to equity funding to advance them in the short term, are more open to financing, joint venture, or acquisition discussions with larger players, or may look to consolidate with better financed peers, particularly when both are working in the same exploration camps. In addition, if equity markets do not improve relatively early in 2012, majors and intermediates looking to finance or joint-venture with cash-strapped junior explorers are likely to negotiate far more favorable terms than they would have in 2011.

Figure 6: Significant Exploration-related Financings[5] by Junior Companies, 2008-11



Source: Industry Monitor, Exploration Activity Service

5 Exploration-related financings include financings of $2 million or more for precious or base metals (as reported in MEG's Exploration Activity Services) by juniors, in which the company indicated that all or most of the proceeds were for exploration; proceeds to be used primarily for acquisitions, development, or debt servicing/repayment are excluded. Although the financing data only covers precious and base metals, these target groups account for most of the exploration spending covered by the CES, and are therefore a reasonable proxy for the amount of nonferrous exploration funding available to the juniors.

LOOKING FORWARD

Despite concerns about the global economy and projections of lackluster growth for most countries, China and other resource-hungry emerging and developing economies are still expected to lead global GDP growth and demand for metals over the next few years. On the supply side, the industry still faces many of the limitations that existed prior to the 2008 economic downturn that effectively set back the clock on many developments. While periods of weakness and volatility will likely continue in the near term, most metals prices are expected to remain above their long-term trends and comfortably above the nominal cost of production through 2012.

Most major and intermediate producers remain committed to exploration to replace mined reserves and strengthen and grow their pipelines, particularly while metals prices stay relatively strong. We expect most producers—many of which have much healthier balance sheets than they did a few years ago—to continue to invest in organic growth, resulting in a moderate increase in their aggregate exploration allocation in 2012.

Exploration spending by risk capital-dependent junior companies may be a different story, however. As the pace of exploration financings weakened in late 2011—traditionally the busiest time of year for junior exploration-related financings as companies cash-up ahead of the upcoming field season—many juniors have had trouble raising the funds needed to sustain or increase exploration spending in 2012. Although early indications are that some juniors plan to increase their exploration budgets in 2012, unless equity markets improve over the first quarter, many will likely be forced to reduce exploration spending this year. We therefore expect a slight decline in spending by the juniors, offset by increased spending by the producers, resulting in a net increase of 5%–15% in exploration spending by the industry as a whole in 2012—a relatively small change compared with the 40%-50% swings of the past few years.

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