

## Argentex advancing new deposit type for Deseado Massif



BY KIP KEEN

Argentex Mining president and CEO Ken Hicks (right) and chief geological consultant Diego Guido look out over Argentex's Pinguino silver-gold-lead-indium project in Santa Cruz province, Argentina.

### SITE VISIT

COMODORO RIVADAVIA, SANTA CRUZ, ARGENTINA — In Argentina's most prolific mining province, Santa Cruz, within the geological region known as the Deseado Massif, **Argentex Mining** (ATX-V) is pushing forward a project unlike any other so far found in the country.

Characteristic of the Deseado Massif area are low-sulphidation epithermal deposits. By and large, this model encompasses ore being mined at the Deseado Massif's four producing mines: Cerro Vanguardia (**AngloGold Ashanti** [AU-N]), Mina Martha (**Coeur d'Alene Mines** [CDM-T, CDE-N]),



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San Jose (**Minera Andes** [MAI-T]) and **Hochschild Mining** [HOC-L]) and Manantial Espejo (**Pan American Silver** [PAA-T, PAAS-Q]).

The low-sulphidation systems are typically related to a lengthy Jurassic event of tectonic extension, which lasted some 30 million years. Stemming from that event, quartz veins and veinlets along with vein stockworks and hydrothermal breccias now predominate. As a source, mineralization comes from Middle to Upper Jurassic volcanics. And as you might suspect, there is little sulphidation in the veins, usually less than 1% by volume.

But at Pinguino, there is something else at work in

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addition to the conventional Deseado Massif model. Diego Guido, Argentex's chief geological consultant, explains that both source and host rock can be older. The former tends to be from the Lower Jurassic, and related to an underlying dioritic intrusion, while the latter is both sedimentary and volcanic, falling into the Middle Triassic to Lower Jurassic epochs.

The effect? At Pinguino, it means there are two sets of vein systems: the typical gold-silver-rich quartz veins and then another, atypical system, of poly-metallic sulphide-rich veins. And chief among those metals Argentex is turning up in sulphides is also unusual for Argentina: high-grade indium — a metal used in, for example, liquid crystal displays and solar cells.

The Pinguino property is about 300 km southwest of the city of Comodoro Rivadavia, an important base of operations for Santa Cruz's oil and gas industry. The drive to the road-accessible project is by and large on gravel highways. The final stretch is a 230-km ride south of Pico Truncado, a utilitarian oil town surrounded by hundreds of pumpjacks extracting hydrocarbons from beneath the arid steppes of Patagonia.

En route to Pinguino, driving down in a crammed Toyota pickup, the most obvious wildlife are ostriches, always hurrying on some seemingly crucial errand, guanacos, llama-like creatures which are traditionally hunted with dogs, and wild horses, remnants of European stock first brought over to South America by Spanish conquistadores. Though puma are also out there, Guido says, he points to a barbed-wire fence with a carcass strung purposefully from it — a deflated big cat — and adds that those are usually the only examples you'll see. The technique of stringing up pumas to fences is used by local sheep herders to deter other pumas from preying on their isolated flocks.

The terrain at Pinguino is fairly typical of much of Patagonia: undulating, dry,



Up close, sulphides are evident in drill-core from Argentex Mining's Pinguino project, in Argentina.

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sparsely vegetated hills. Few live out here save a handful of ranchers. Though there is not much in the way of surface water, groundwater abounds. Covering the property, then, is not difficult, and Guido and Argentex president and CEO Ken Hicks give a tour of their property mostly on foot, easily covering Argentex's most important vein-targets, from silver-rich Marta Norte to indium-rich Ivonne, in a few hours.

Based on delineation by surface-sampling, more than a dozen nearly vertical veins form a kind of latticework throughout a 16-sq.-km area that has been the zone of concentration at Pinguino for Argentex. There are at least 14 drilled veins, and many others that, as of yet, Argentex has only sampled at surface or postulated from geophysics. On the entire

100-sq.-km property, Argentex has sampled nearly 50 mineralized veins.

Why no one recognized sulphide potential at Pinguino before becomes obvious as Hicks and Guido guide visitors over the property. The quartz veins, more typical of the Deseado Massif region are obvious. Marta Norte and Noroeste, for example, occasionally outcrop at surface.

But tracking southeast to Marta Centro and Ivonne, the story changes. For the most part, walking across these veins, the ground is merely a mix of small, sharp gravel mixed with sand and soil. There is no indication of the veins, other than the white PVC-piping that still sticks out of the ground at old drill-hole collars.

"You don't see nothing," Guido says as we walk to Marta Centro.

The reason why is simple weathering.



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The predominantly quartz veins stick out like spines of monsters lurking underground because the rock is harder. But the sulphide veins that Argentex has discovered, in part through soil-sampling and trenching in 2005, are far softer and, under the harsh Patagonian elements, crumbled to the ground. But they are there.

At one old trench you can see the darker hue of Centro's sulphides in a crumbly near-surface matrix, remnants of a vein a couple of metres wide.

"We found, blind, veins like this in the south," Guido says. "Marcela, for example, (is the) best of all (at the) project."

After Argentex drilled into the sulphide targets, it was obvious to Guido and Hicks that they had something completely different on their hands at Pinguino. Argentex's first resource estimate, released shortly after *The Northern Miner's* visit to the project, clearly demonstrates the point.

Marta Norte, for example, the first target *The Northern Miner* walked, has an indicated resource of 310,000 tonnes grading 117.18 grams silver per tonne, 0.191 gram gold, 0.21% lead, 0.09% zinc, and 0.01 gram indium. Centro, however, one of those near-invisible sulphide-rich mineralized areas, weighs in at 5.4 million indicated tonnes grading 25.51 grams silver, 0.179 gram gold, 0.55% lead, 1.84% zinc and 20.31 grams indium. Notably, of course, the lead, zinc and especially indium have increased here.

Thus what has bloomed at Argentex is a bit of a schizophrenic resource with both silver-gold-rich and indium-rich veins making up the whole: something to keep in mind when reading Argentex's aggregated indicated resource, which stands at 7.3 million tonnes grading 32.54 grams silver, 0.253 gram gold, 0.49% lead, 1.47% zinc and 16.26 grams indium.

Guido gets most of the credit for both noticing and then unravelling the hidden sulphide half of Pinguino. Guido, now an academic but also a former AngloGold

Ashanti employee, had in the late nineties seen core drilled by AngloGold Ashanti and 50% joint-venture partner Mincorp on the Pinguino property. He remembers thinking: these are really interesting and don't look like they're from the Deseado Massif, where they were in fact drilled. So in 2004, in his capacity as a professor at La Plata University in Buenos Aires, he wrote to Argentex, which was actively exploring Pinguino, to propose making the proper-

ty a PhD project for one of his students.

Argentex agreed and Guido has consulted with the company ever since. In 2004, Guido spent a field season logging samples on vein targets at Pinguino with his students. Through their work, they began to spin the sulphide tale. While previous drilling had to some degree picked up on the sulphides, it was ultimately lab work on samples Guido and his students analyzed that led to the discovery of just how significant the



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Argentex Mining chief geological consultant Diego Guido (right) shows an investor drill core from the Pinguino property, in Argentina.

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A drill-hole collar at Argentex Mining's Pinguino deposit in Argentina.

sulphide content was, and, tantalizingly, that it contained indium.

This, in turn, upended the model previous explorers had relied upon. "They had thought it was a low-epithermal system into base metals and that was it," Guido says. "In fact, they had the wrong model."

Equally important for Argentex was Hicks' part in ensuring the company held onto the property. In the late 1990s, Chris Dyakowski, former president of Argentex before Hicks took over the role in 2005, wanted to know which of his Argentine properties he should pursue. In 1998, Dyakowski contacted Hicks, given his long résumé of working on projects in Argentina, to have him assess a number of those prospects.

Hicks remembers giving Dyakowski a list of those he thought had

potential, Pinguino among them, and saying: "These are keepers."

One target that both Hicks and Guido are excited about hitting at Pinguino is the El Tranquilo fault-vein system. Within a kilometre or so southwest of Argentex's Pinguino resources, El Tranquilo represents the biggest question mark for the company. Yes, there are many other vein targets to assess and, yes, Argentex's defined targets are more or less all open along strike and at depth, so in other words, the company already has a lot on its exploration platter; but El Tranquilo is unquestionably the largest vein of the surrounding region, with widths as broad as 30 metres, and a strike length at least 6 km long.

The El Tranquilo fault-vein system is the chief reason for mineralization

and resources at Pinguino within veins running more or less parallel to and perpendicular to it. The El Tranquilo fault-vein system appears to be the main tap into a deeper dioritic dome underlying the property known as the La Leona formation. La Leona also intrudes at surface, coincident with the El Tranquilo fault-vein system.

The question is, what does El Tranquilo hold? All Hicks and Guido really know about it so far, in terms of metal content, is that there is some disseminated oxide copper mineralization exposed, and visible, at surface. Though only speculation, Hicks supposes that if there is significant mineralization in El Tranquilo, it would likely come in the form of a "string of pearls." The trick, of course, is finding one of those pearls.

For now, that uncertainty of where to look is keeping Guido and Hicks somewhat cautious in terms of making a commitment of valuable drilling resources to El Tranquilo. Hicks agrees with Guido when the Argentine explains that for Argentex and its exploration success, science and understanding the genesis of mineralization have been keys to success.

"Everyone is telling me, 'Why don't you drill Tranquilo,'" Guido says. "You know it could be huge. But I want to be sure before I drill."

That will mean refining and developing models and committing to basic field-work, which includes sampling and extensive lab analysis of the kind that generated Argentex's sulphide model in the first place, before collaring drill-holes at El Tranquilo.

So far, that reliance on science and sampling has worked well. Hicks brags that of 269 holes Argentex has put into the ground, no more than three have missed their targets. Soon after noting this statistic, and with Tranquilo and the potential to expand existing resources on his mind, Hicks concludes, "Now is our time to shine."