

# Navan - New Boliden



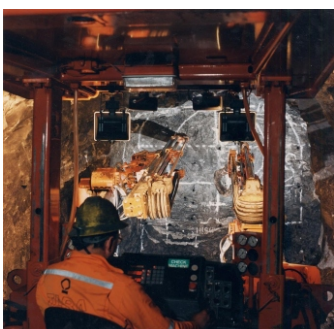
Discovered in 1970 and brought into production in 1977, the Navan deposit supports the largest underground zinc mine in Europe and the fifth largest in the world. The mine is owned by New Boliden and operated by its wholly-owned subsidiary, Tara Mines Limited. The orebody comprises a stacked series of lenses of massive sulphides hosted in Lower Carboniferous carbonates that formed in a shallow tropical sea over 350 million years ago. Situated between 50 and 900 metres below surface, the minable thickness of the Navan orebody ranges from 15 to 80m, the latter value more common in the eastern section. In plan, the deposit stretches over an area of 4km by 1.5km. The ore minerals are sulphide of zinc (sphalerite) and lead (galena) with sulphides of iron (pyrite and marcasite) occurring as accessory minerals. Small amounts of silver are also present.

A number of processing stages transform the mineralized rock at Navan into Tara's prime asset, the zinc concentrate. At first the rock is blasted and crushed underground to a size of less than 150mm. Cone crushing follows once the ore is brought up to the surface, bringing down the material to minus 16mm. The ore is then mixed with water and further reduced in size. The final stage is flotation, when the zinc and lead minerals become separated from its host rock. The zinc and lead concentrates are dewatered, to reduce their residual moisture content to 9 and 6% respectively and then transported by rail to Dublin Port for shipping to smelters around Europe. It is in those smelters that lead and zinc metal are produced from the concentrates.

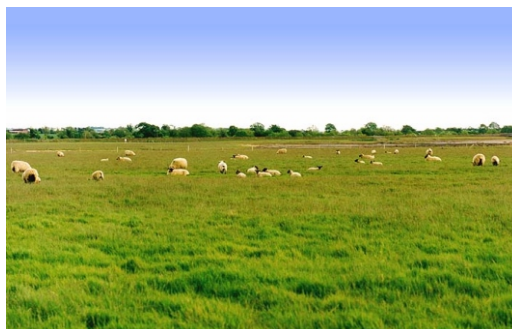
Production at the **New Boliden Tara Mines** mine during 2007 was 2.66Mt at 7.72% Zn and 1.47% Pb. This milled tonnage yielded 191,000t of zinc, and 25,600t of lead metal in concentrate. Total mine production (1977-2007) amounts to 68.2Mt at 8.36% Zn and 2.00% Pb. At the end of 2007, Tara's JORC Classified Ore Reserves (Proven and Probable) were 17.8Mt at 7.7% Zn and 1.7% Pb. In addition, there were 13.5Mt at 7.2% Zn and 2.1% Pb in Mineral Resources (Measured, Indicated, and Inferred). Diamond drilling in SWEXB (Southwest Extension B) encountered additional good intersections of high-grade, U-lens ore. Near-mine drilling during the year targeted several different areas around the orebody, and located an area south and east of SWEX with strong mineralization. Also in 2007, the company announced a major €26.5M capital investment in the concentrator; this consisted of the replacement of the existing crushing and grinding system with a new circuit for autogenous grinding. Taken with previous capital investments (including pressure filtering dewatering of concentrates), it is expected that the overall operating costs for the concentrator will be reduced by 30%. Tara also expects to see an increase in zinc recovery, and an improved working environment in the concentrator.

## References:

- Pyne, J., 2007. Industry News: Recent Developments in Exploration and Mining. In: State Mining and Prospecting Facilities and Industry News, EMD, Dublin, 19-20
- The *New Boliden-Tara* website (<http://www.boliden.com/www/en/bolidenen.nsf/>)
- Ashton, J.H., Holdstock, M.P., Geraghty, J.F., O'Keefe, W.G., Martinez, N., Peace, W. and Philcox, M.E. 2003. The Navan Orebody - discovery and geology of the South West Extension. In: Kelly, J.G., Andrew, C.J., Ashton, J.U., Boland, M.B., Earls, G., Fuscuardi, L. & Stanley, G. *Europe's Major Base Metal Deposits*. Irish Assoc. Econ. Geol., Dublin 405-436
- Ashton, J.H., Downing, D.T. and Finlay S. 1986. The geology of the Navan Orebody. In: Andrew C.J., Crowe, R.W.A., Finlay, S., Pennell, W. and Pyne, J.F. (Eds.), *Geology and genesis of mineral deposits in Ireland*. Irish Assoc. Econ. Geol., Dublin, 243-280
- Anderson, I.K., Ashton, J.H., Boyce, A.J., Fallick, A.E. and Russell, M.J. 1998. Ore Depositional processes in the Navan Zn-Pb deposit, Ireland. *Econ. Geol.*, **93**, 535-563.



Preparing for blasting underground



Rehabilitated mine tailings near Navan



Surface view