SEDEX Deposits
(Sedimentary Exhalative)
SEDEX Ore
Zn-Pb Reserves and Production by Deposit Type

**Zinc Metal Reserves by Deposit Type**
- Carbonate-hosted: 54%
- Volcanic rock-hosted (VMS): 23%
- Clastic sediment-hosted (SEDEX): 11%
- Other/Unidentified: 9%
- Vein: 3%

**Lead Metal Reserves by Deposit Type**
- Carbonate-hosted: 61%
- Volcanic rock-hosted (VMS): 18%
- Clastic sediment-hosted (SEDEX): 16%
- Other/Unidentified: 3%
- Vein: 2%

**Zinc Production by Deposit Type**
- Carbonate-hosted: 31%
- Volcanic rock-hosted (VMS): 25%
- Clastic sediment-hosted (SEDEX): 9%
- Other: 30%
- Vein-hosted: 5%

**Lead Production by Deposit Type**
- Carbonate-hosted: 25%
- Volcanic rock-hosted (VMS): 26%
- Vein-hosted: 11%
- Clastic sediment-hosted (SEDEX): 33%
- Other/Unidentified: 5%
Grade and Tonnage of all SEDEX Deposits
## Grade and Tonnage of some SEDEX Deposits

<table>
<thead>
<tr>
<th>Country</th>
<th>Deposit</th>
<th>Tonnage of ore in Mt (reserves and past production)</th>
<th>Grade</th>
<th>By-products</th>
<th>Age</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cu%</td>
<td>Pb%</td>
<td>Zn%</td>
</tr>
<tr>
<td>Australia</td>
<td>Broken Hill</td>
<td>180</td>
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<td>11.3</td>
<td>9.8</td>
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<td>McArthur River</td>
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<td>Mount Isa</td>
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<td>0.06</td>
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<td>1.5</td>
<td>6.0</td>
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<tr>
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<td>Sullivan</td>
<td>160</td>
<td>—</td>
<td>6.6</td>
<td>5.9</td>
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<tr>
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<td>Silvermines</td>
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<td>Gamsberg</td>
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Lower to Middle Proterozoic
Middle Proterozoic
Silurian
Middle Proterozoic
Devonian
Devonian
Carboniferous
Carboniferous
Carboniferous
Middle Proterozoic
Sedex deposits of the Selwyn Basin
Tom SEDEX Deposit, Yukon

15.7 x10⁶ tons
7% Zn, 4.6% Pb,
49 ppm Ag

Stratified ores: **Black facies** (carbonaceous chert, sphalerite, galena); **Grey facies** (grey chert, barite, sphalerite); **Pink facies** (chert, pink, cream, black sphalerite, barite, galena)

![Pink Facies Image]
Selwyn Basin and Extensional tectonics
Distribution of Sedex Deposits relative to Late Devonian Paleogeography
Distribution of Sedex Deposits relative to Proterozoic Paleogeography

**DISTRIBUTION OF PROTEROZOIC SEDEX ZN–PB DEPOSITS**

- Rajpura–Dariba, Ambaji
- Zawar
- McArthur River
- Broken Hill
- Mount Isa
- Sargipali
- Aggeneys
- Gamsberg
- Ducktown
- Balmat–Edwards

**LEGEND**
- Sediment linkage
- Mesoproterozoic sedimentary rocks >2km thick
- 1.5 Ga mafic sills and dykes
- Generalized area of 1.5-1.4 Ga Mesoproterozoic intrusive rocks
- 1.5-1.4 Ga granite-ryolite province
- Century
- Mount Isa, Hilton, etc.
Distribution of SEDEX Deposits with Time
Marine $\delta^{34}\text{S}$ and SEDEX deposits
Atlantis II Deep a SEDEX Deposit in the making
Antlantis II Deep

- **Density stratified brine pool**
- **Overflow brine pool**
- **Stockwork**
- **Fault zone**
- **Massive sulphide body**

<table>
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<tr>
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<tr>
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<tr>
<td><strong>Mg</strong></td>
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<td><strong>H₂S</strong></td>
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<td><strong>Zn</strong></td>
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<tr>
<td><strong>Cu</strong></td>
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<td><strong>Pb</strong></td>
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</tr>
<tr>
<td><strong>Ba</strong></td>
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Creating the Environment for SEDEX Deposits
The Rift Environment
Towards a SEDEX model
Conditions of Metal Transport/Deposition