Environmental Opportunities in the Gold Mining and Urban Mining Sectors...

66,000 tonnes of Cyanide is used annually in mining

1,400 tonnes of Mercury is used annually in mining

Mine operators under pressure for environmental change

50,000,000 tonnes of E-Waste is generated annually and growing

$62 Billion USD in precious metals is used in electronics annually

No eco-friendly & sustainable solution for recycling E-Waste
EnviroLeach is a technology company that has created a proprietary environmentally friendly solution to extract precious and strategic metals from ores, concentrates and E-Waste...
How Environmentally Friendly?

All ingredients in EnviroLeach’s patent pending formula are FDA approved for human consumption ...
Current Extraction Processes

Current Processes are toxic, caustic & non-scalable...

**Smelting**
- Most Widely Used Solution
- Limited Capacity
- CO2 Pollution from Organics & Transportation
- Each Smelter Prefers Unique Recipe

**Acid Based**
- Nitric Acid
- Hydrochloric Acid
- Sulfuric Acid
- Toxic Emissions
- Not Scalable
- Requires Heating & Off gas Controls

**Cyanide Based**
- Toxic to Environment
- Not Safe for Workers
- Expensive detoxification Dangerous to Transport
- Toxic Tailings
- Negative Public Perception
- Not Cost effective for E-Waste
The EnviroLeach Alternative

A simple equation that solves a very complex problem...
Process Overview

Preparation

Material preparation, separation, grinding and classification...

Dissolution

The ground material is dissolved in the lixiviant for a pre-specified time...

Extraction

The metals are recovered from the solution using: ion exchange, carbon absorption, EW or precipitation...

Recovery

The precipitate, carbon or electrodes are refined to recover 999 gold plus other strategic metals...
EnviroLeach Process

Benefits

- Broad applicability spectrum
- Fast leach kinetics
- Near neutral pH
- Ambient temperature
- No toxic off gassing or landfilling of waste
- Water based chemistry
- Environmentally friendly
- Safe, reusable and sustainable
Two Patent Applications Pending:

- The preliminary patent was filed in June 2016 as a provisional application and relates to the main components of the lixiviant solution and the methods of use:

- A Second application was filed that covers the technology related to the conductive diamond electrodes as used in the EnviroLeach process and the efficiency gains from the inclusion of a new chemical additive.

- The application also concerns additional modifications to the chemistry that improve the performance of the process.

Various percentages of each component and combinations of the components were included. Worldwide rights have been preserved by filing the application as both US and international (PCT) patent applications.
Gold Mining Sector 2017 - $121B USD
Benefits to Mining Sector...

- Only cost-effective alternative to Cyanide
- Broad applicability spectrum to most ores
- Fast leach kinetics
- Environmentally friendly & Sustainable
- Reduced permitting process
- Access to environmentally sensitive areas
- Reduced environmental footprint
- Enhanced commitment to social responsibility
- In-Situ leaching – new development
### Gold Mining Sector

Applicability to mining/extraction methods exceed 80%

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**EnviroLeach vs Cyanide...**

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cyanide</th>
<th>EnviroLeach</th>
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<tbody>
<tr>
<td>Cost effective dissolution of Gold</td>
<td>✔️</td>
<td>✔️</td>
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<tr>
<td>Fast Leach Kinetics</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Ambient Temperature</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Broad Applicability Spectrum</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Reusable/sustainable</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Broad pH spectrum</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Non-toxic to humans and animals</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Environmentally friendly</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>No Detoxification System required</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Easy/Safe to Transport and Handle</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Effective on copper/arsenic/pyrite</td>
<td>✔️</td>
<td>✔️</td>
</tr>
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<td>Reduced permitting process</td>
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Gold Mining Sector

Applicability to mining/extraction methods exceed 80%

EnviroLeach vs Cyanide...

Leach Kinetics Efficacy

- 1 g/l NaCN (reference)
- ETI Baseline
- ETI Optimized

Au Recovery (%) vs Leach Time (hours)
Royalty Based Revenue Model

Mining Partner Plants

1. Partner Constructs
2. Partner Collects
3. Partner Processes
4. Royalties to EnviroLeach

- Entry Fee/Mining Site
- Perpetual Royalties based on production rates of gold
- Payments increase with higher production rates
- Production requirements must be met to retain licenses
Technology Partners

elementsix™

emew
clean technologies
E-WASTE SECTOR

2017 - $48B USD
Electronic waste (E-Waste) is the fastest growing portion of the municipal waste stream expected to grow to 78 million tons by 2026...
(Source: TMR - 2017)

Every 60 Seconds
98 tons of E-Waste is generated...
**E-Waste Value**

Over $62B USD in metals used in electronics annually

**Conventional Mining**
Gold from 1 Tonne of Ore (Avg. 1.8 gpt Au)

**Urban Mining**
Gold from 1 Tonne of E-Waste (50 to 2,400 gpt Au)
The Opportunity...

50 million tons of E-Waste produced annually ($48 B USD)

OEM's looking for "Green" sustainable solutions

Smelters looking for solution to increase capacity & lower organic content

Significant precious metal content (15 to 2,000 gpt)

Limited alternatives for smelters, recyclers and OEM's

Highly fragmented, early life-cycle sector

Less than 25% recycled

No current domestic solution

EnviroLeach offers environmentally friendly smelting enhancement

EnviroLeach
Revenue Sources

1. Corporate Plants
2. Joint Ventures
3. Licensing/Royalties
Global Partner

- 3rd largest contract electrical manufacturer in the world
- Jabil Inc. - NYSE Listed, #152 on the Fortune 500 list
- 175,000 employees
- 100 locations in 28 countries
- $20 Billion in Annual Revenue
- Active in the E-Waste Sector

Clients include Apple, Cisco, Dell, HP, iRobot, Defense & Aerospace and hundreds of others…
Target Materials Overview

- Printed Circuit Boards
- Cable Boxes
- Modems
- PC & Server Power Supply
- Pin Pads
Target Materials Overview

PRODUCT FOCUS ANALYSIS

- Product Availability
- % Gross Margin
- Low Assay/Value Risk
- Low Inventory Cost
- Low Competitor Ratio

VALUATION ELEMENT

- LOW GRADE BOARDS
  1. Low Assay/Value Risk
  2. Low Inventory Cost
  3. % Gross Margin
  4. Low Competitor Ratio
  5. Product Availability

- WHOLE POWER SUPPLIES
  1. Low Assay/Value Risk
  2. Low Inventory Cost
  3. % Gross Margin
  4. Low Competitor Ratio
  5. Product Availability

- WHOLE CABLE/SAT BOXES
  1. Low Assay/Value Risk
  2. Low Inventory Cost
  3. % Gross Margin
  4. Low Competitor Ratio
  5. Product Availability

- MID GRADE BOARDS
  1. Low Assay/Value Risk
  2. Low Inventory Cost
  3. % Gross Margin
  4. Low Competitor Ratio
  5. Product Availability

- HIGH GRADE BOARDS
  1. Low Assay/Value Risk
  2. Low Inventory Cost
  3. % Gross Margin
  4. Low Competitor Ratio
  5. Product Availability

- MEMORY AND FINGERS
  1. Low Assay/Value Risk
  2. Low Inventory Cost
  3. % Gross Margin
  4. Low Competitor Ratio
  5. Product Availability
Competitive Strengths

- 75% Mass Yield Reduction
  - Increased Through-Put
  - 75% Smelter & Shipping Savings
  - Improved Payable Metal Content

- Improved Economics
  - Lower Smelter/Refining Charges
  - Increased Payable Metals
  - Lower Shipping & Treatment Costs

- Compliant with New Intl & USA Environmental Laws
  - New Laws Mandate Limited Export & Domestic Solutions
  - EnviroLeach Only Cost-Effective Option

- Allows for the shredding of whole components
  - Guaranteed Destruction
  - Cost Savings on Manual Disassembly
  - Reduction in Handling Fees

- 93% Reduction in Organics
  - Reduced Carbon footprint
  - Attractive Product for Smelters
  - No Landfilling of Materials

- Environmentally Friendly & Sustainable Solution
  - Increased Social Value for Smelter, OEM & Recycling Partners
  - Reduced Environmental Footprint (Almost Zero)
  - Sustainable solution
20,000 Square Foot Facility

20 TPD/6,000 TPA Facility
Each 6,000 tonne per Year Facility will produce:

- 10,000 Ounces of Gold
- 1,500 Ounces of Palladium
- 100,000 Ounces of Silver
- 1,200 Tonnes of Copper
- 500 Tonnes of Aluminum

*Above Estimates Based on Processing Low Grade Printed Circuit Boards*
Facility Highlights

- Low Capital Expenditure - Under $8.0 M
- Low Operating Cost/High Margin (30% +)
- Environmentally Friendly
- Attractive Environmental Solution for all Municipalities
- Small Operational Foot Print
• Only cost-effective solution for low-grade E-Waste
• 75% smelter and shipping cost reduction
• Improved payable metal content from smelters & refiners
• Improved assay accuracies
• No manual disassembly of certain whole components
• Offers cost-effective alternative to traditional smelting of circuit boards
• Domestic solution
Environmental Advantages

- 90%+ smelter emissions reduction
- No landfilling of solid waste
- No water effluent/pollution
- No atmospheric off gassing
- Lowest carbon emissions
- Lowest environmental footprint
- Ambient operating temperature
- Unique & sustainable recyclability of our patented solution
- Small operational footprint
- Diversified Industry Sector Revenue Opportunities
- Proprietary patent-pending formulas and processes
- Accelerated ROI on corporate plants
- Limited or no competition
- Significant economic advantage over existing technology/models
- Low-cost raw goods
- Low risk of assay/value deficiencies
enviroleach