

EXCERPTS FROM

**"Survey on Sludge Management
and Equipment"**

Survey Report #196

by

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5.0 Identification of Recent Vendor Trends

What are some of the most important recent trends among firms which offer sludge management services and products?

5.1 Response

The FTS panel listed the following:

- Cost control and environmental issues
- Necessity of financial resources to be in the high tech part of business
- Diversification
- Alkaline stabilization
- Heat dryers
- Composting
- Increased teaming arrangements to meet local political requirements in the service industry
- Development of in-house political savvy
- Small firms being bought-up by capital-rich, large firms providing money for research and development, mergers and acquisitions, and privatization
- Privatization of drying/fertilizer production systems

6.0 Forecast of Future Vendor Trends

How do you foresee this changing within a five-year timeframe?

6.1 Response

The FTS panel listed the following:

- Landfills should decrease
- New technologies should reach commercial status
- PFRP technologies will increase to 29% market by the year 2000
- More consolidation within the industry
- Mega-companies competing for projects to provide engineering design, construction and operating services
- More privatization allowing municipalities to reduce capital expenditures

7.0 Factors Contributing to a Competitive Edge

What are the most important factors which give some sludge management firms a competitive edge?

7.1 Response

The FTS panel listed the following:

- Experience (2)
- Awareness of international development
- Higher dewatering efficiency
- Low costs
- Ability to contract with local partners
- In-house technical expertise
- Offering turn-key services that include site acquisition, permitting, operations, public education/relations programs, and regulatory compliance

- Number of offices
- Political connections to simplify permitting process for land application
- Availability of cash for privatization

8.0 Municipal Sludge Disposal: 1996

What is the distribution of municipal sludge disposal in 1996? (EPA figures for 1990 given below)

8.1 Response (See also Figure 8.1)

	1990	1996
Dumped in landfills	41.8%	29.8%
Incinerated	21.1%	16.5%
Land application: used to fertilize farms, parks, forests	15.6%	27.9%
Distribution	9.0%	17.5%
Ocean disposal	5.4%	.5%
Surface disposal	2.5%	1.4%
Monofills	1.3%	1.2%
Other	3.3%	5.2%
	100.0%	100.0%

9.0 North American for Disposal and Treatment: 1991-1996

What is the sludge market in North America for disposal and treatment, operations and maintenance expenditures?

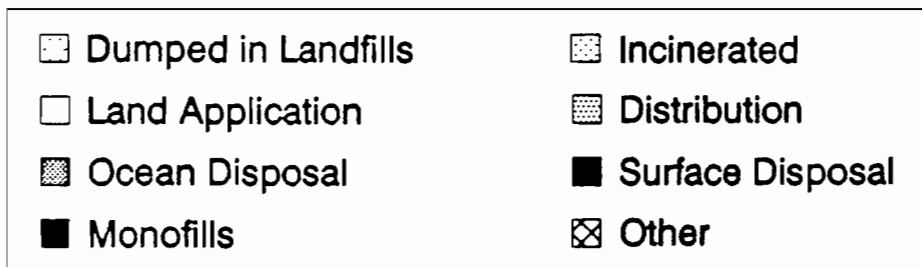
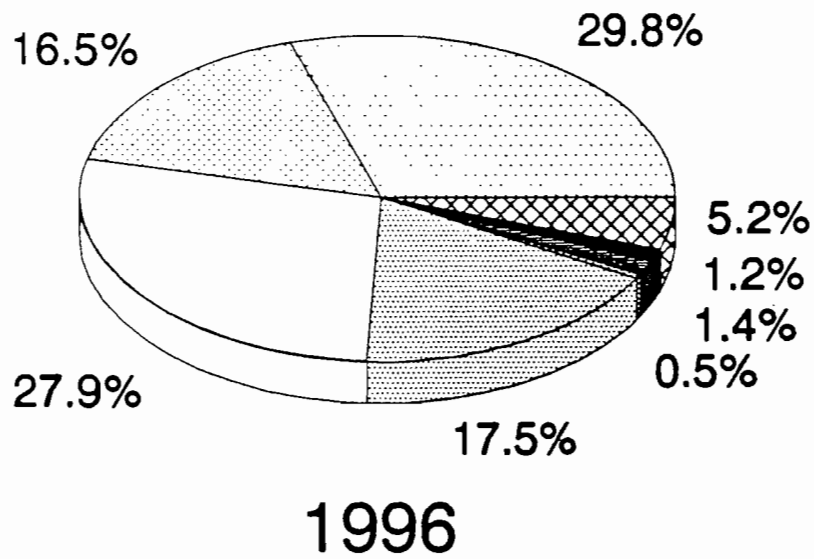
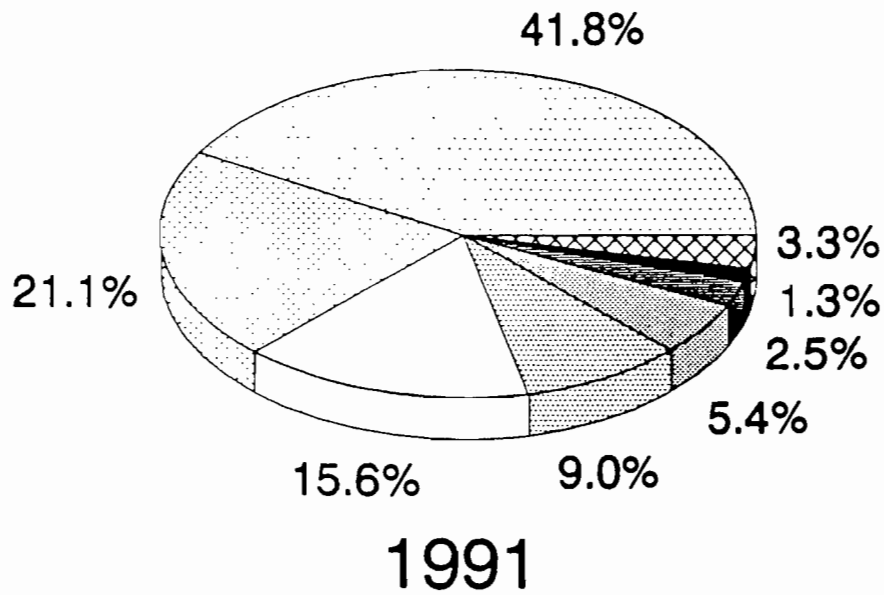


Figure 8.1 Municipal Sludge Disposal

Source: Future Technology Surveys, Inc.

9.1 Response

Median response:

1991: \$800 million

1996: \$1.2 billion

10.0 North American Market for Equipment: 1991-1996

What is the sludge market in North America for capital expenditures, equipment (dewatering, solidification, etc.)?

10.1 Response

Median response:

1991: \$500 million

1996: \$800 million

11.0 North American Market for Facilities: 1991-1996

What is the sludge market in North America for capital expenditures, facilities?

11.1 Response

Median response:

1991: \$750 million

1996: \$1 billion

12.0 Market Leaders

What companies are market leaders in the sludge management equipment and services field?

12.1 Response

The FTS panel listed the following:

- International Process Systems (IPS) (6)
- Bio Gro Systems, Incorporated (4)
- JWP Enviro-Gro Technologies (4))

Also mentioned:

- N-Viro (3)
- Ad+Soil, Incorporated
- Alfa-Laval Separation, Incorporated
- Andritz - Ruthner
- Aqua Tec, Incorporated
- Bird Machine Compnay, Incorporated
- Envirex
- Klein America, Incorporated
- Kloenckner Humboldt Deutz (KHD)/Humboldt Decanter
- Komline-Sanderson
- Stord, Inc.

13.0 Factors Contributing to Market Growth

What factors would contribute most significantly to growth in the sludge management equipment and services market?

13.1 Response

The FTS panel listed the following:

- More efficient
- More government support for additional WTP
- Product market guarantees

- Strict regulations on landfill, thus increasing the cost of landfill
- EPA-503 regulations
- Public perception that recycling is positive for the environment
- Increase in energy prices
- Changing regulations
- Public acceptance issues

14.0 Identification of Emerging Technologies

What emerging technologies do you foresee as having the greatest impact on the sludge management field?

14.1 Response

The FTS panel listed the following:

- Alkaline stabilization (2)
- Composting (2)
- Heat dryers (2)
- Valorization technologies such as agricultural products and oil from sludge (OFS), etc
- Indirect drying with simultaneous pelletization
- Enhancement in dewatering and drying technologies
- Continued development and improvements in in-vessel composting and co-composting
- Chemical addition to promote stabilization
- Direct land application

15.0 Challenges Facing the Industry

What do you see as the greatest challenges that the sludge management industry will face during the next decade?

15.1 Response

The FTS panel listed the following:

- Public education (2)
- Public acceptance of sludge as a reusable resource
- Cost reduction versus environmental consideration, especially in the air emissions regulations
- Financial resources
- Public opposition to beneficial reuse
- Public relations
- Consistent permitting requirement among the states
- Public acceptance of incineration facilities as safe systems with good air emission controls

16.0 Identification of Best Opportunities

What are the areas of best opportunities related to this field?

16.1 Response

The FTS panel listed the following:

- Simpler and less costly sludge management systems for small installations
- Privatization of sludge management
- Development/engineering of sludge management programs

21.0 Potential Market Pitfalls

What market pitfalls do you foresee for firms in the sludge equipment or services business?

21.1 Response

The FTS panel listed the following:

- Lack of strict regulations for landfill and ocean dumping
- Difficulties to get new technologies accepted
- Lack of O&M costs along with the proven reliability of those technologies
- Susceptibility to local political factors
- High maintenance costs for mechanical equipment
- Lack of public acceptance
- Public attacks from competitors
- The sludge management market is very fragmented
- A consolidation of smaller firms will be necessary for significant profitability
- Not putting enough effort into regulatory, public relations and other "soft areas" of business

22.0 How the Industry will Evolve to the Year 2000

Briefly, how do you see the sludge management business evolving over the next decade?

22.1 Response

The FTS panel listed the following:

- In North America, the existing installations will be refurbished to improve the efficiency

- New plants being built in smaller towns
- Internationally, the East European countries will need lots of improvement
- Developing countries will require WTP on a large scale
- Major expansion
- A trend toward beneficial reuse with reduced use of disposal options
- Survivors will be the firms that offer turn-key services and have financial strengths, especially bonding
- Decision makers will be more politically oriented because this is a big dollar business
- Public acceptance will be a big factor
- Increased demand for cost effective solutions