Bay Area Hazardous Waste Treatment Facilities: Capacity, Technologies, & Planning Trends Update

ABAG Staff Report
to the

Hazardous Waste Management
Facility Allocation Committee

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Summary

Does the San Francisco Bay Area have enough hazardous waste treatment facilities to manage the projected industrial growth around this region? This question has been a central concern of the Hazardous Waste Management Facility Allocation Committee (Committee) since its formation in 1990.

This year, in addition to answering that question using the quantitative Fair Share Allocation Formula, the Committee asked staff to undertake a qualitative assessment of Treatment Storage and Disposal Facilities (TSDs) located in the 9 Bay Area counties. ABAG staff, in consultation with the Committee's Technical Advisory Committee (TAC) members, designed a survey to find out more about the diverse TSDs. Following the tabulation of the surveys, staff visited participating TSDs, contacted regulatory agencies, and prepared this report.

A key assumption of the Committee to date, based upon planning efforts, has been that the Bay Area did not have enough treatment capacity to manage the amount of hazardous wastes generated, and that there was a mismatch between local hazardous waste treatment methods and the treatment methods required for locally generated wastes. However, this report notes a significant increase in regional treatment capacity since the last effort by the Committee to compile information on capacity. The Bay Area is going into the next decade with significantly more treatment capacity than was anticipated in 1990.

While the region has seen an overall increase in treatment capacity, individual counties have not. Contra Costa, Napa, Sonoma, and San Francisco have no permitted TSDs. Alameda, San Mateo, and Santa Clara each have one large TSD and one or more smaller facilities. Marin County has a small recycling facility.

This report provides the results of the surveys of the Bay Area's nine Commercial Hazardous Waste Treatment Facilities (as they are called by DTSC). It recommends modifying the Fair Share Formula in ways that will make it more transparent with manifest data. Lastly, the report looks at E-Waste and how local TSDs are trying to keep and expand E-waste recycling in the Bay Area.

Findings

1) Although new facilities have opened in the Bay Area over the past decade, there has been a net reduction in local TSDs. There are currently nine Commercial Offsite Treatment Facilities in the San Francisco Bay Area. New facilities, such as Allied Technologies and Ecosystems, have attempted to open in the Bay Area, but these businesses do not seem to have been viable. While the individual reasons for the new companies'

failure have varied, this local trend mirrors a national trend of fewer large facilities with expanded waste streams.

2) While the number of TSDs has declined, permitted capacity in the nine-county Bay Area will likely increase because Evergreen, Romic and Clean Harbors have expanded or are seeking to expand treatment capacity.
3) It is extremely unlikely that a new large commercial TSD would want to open in the San Francisco Bay Area. Such TSDs encounter siting difficulties throughout much of the country. Rather, existing TSDs are expanding capacity.
4) TSDs that reclaim precious metals are the most prevalent type of TSD in the Bay Area but compared to Romic and Clean Harbors they have small permitted capacity. Within the last several years, these metals reclaimers cite a weak economy, and the movement of computer production facilities abroad, as the main reasons that business is down (fewer hazardous wastes processed), and that they are not interested in increasing capacity.
5) The metals reclamation TSDs are very interested in capturing the E-waste market. Currently E-waste is not included as part of the Fair Share Formula because E-waste does not require a manifest. However, some E-waste, once processed by a local TSD, may need a manifest when it leaves the local TSD.
6) Metals reclaimers are concerned about how E-waste disposal will be regulated in the future by the state and federal governments. Local TSDs would like to remain local and process larger volumes of E-waste.
7) Four changes are proposed to Fair Share Formula, which will simplify the categories of TSDs, aligning them with the categories used in the manifests. They will allow the Committee to track wastes from cradle to grave.

Recommendations

1) Accept findings of report and use revisions in Fair Share Formula identified in Section III, pages 14, 15 on test basis for current and next years' data analyses.
2) Track E-waste regulatory issues closely to ensure Committee is kept abreast of emerging trends. DTSC has classified E-wastes as universal wastes, a subset of hazardous wastes with reduced management and transportation requirements. E-Waste regulatory concerns now in play include financial incentives for E-waste recycling, local government responsibility initiatives, and regulatory program (DTSC) changes.
3) Task Committee or local agency staff to update the Committee periodically on the status of Bay Area TSDs (i.e. maintain a more active ongoing relationship with them). This will allow the Committee to stay abreast of regulatory and market pressures regarding E-wastes and other emerging classes of hazardous wastes.

4) Continue to look at local hazardous waste issues that are outside of the scope of DTSC's annual reports. This report is an example of one such study. Other issues that may be considered for future studies include:
    - local policy considerations in hazardous waste management facility siting, expansion and/or management;
    - regional hazardous waste minimization efforts; and
    - local emerging hazardous waste treatment/recycling developments.

    Another example of an emerging issue that may have very significant impacts on Bay Area hazardous waste generation levels is E-Wastes. If the Bay Area's TSDs that process E-wastes are successful, then Alameda and Santa Clara counties may see large increases in hazardous waste generation. These increases would not be due to new process inefficiencies at the TSDs, but rather as a bi-product of recycling E-waste (which as a universal waste is not received under manifest).

The report is organized into the following sections:

I. SURVEY OF BAY AREA HAZARDOUS WASTE TREATMENT FACILITIES
II. CLASSIFICATIONS OF HAZARDOUS WASTE TREATMENT FACILITIES UNDER THE FAIR SHARE FORMULA
III. PROPOSED MODIFICATIONS TO THE FAIR SHARE FORMULA
IV. SITING ISSUES
V. CONCLUSIONS

APPENDIX A. Workplan
APPENDIX B. Summary of Interviews and Site Visits with Bay Area TSDs
APPENDIX C. Common Hazardous Waste Treatment Technologies

I. SURVEY OF BAY AREA HAZARDOUS WASTE TREATMENT FACILITIES

In the summer of 2003, ABAG staff, in consultation with TAC members, designed a survey for the region's Commercial Offsite Hazardous Waste Management Facilities, as they are called by DTSC in an annual listing. Staff attempted to reach all 13 facilities on DTSC's list dated 2002. Several facilities had gone out of business. One facility declined to participate in the survey. Nine active facilities participated in the survey.

The results of the surveys were entered into an Access database. The results were compiled and are presented as Appendix B Follow up visits were made to the following facilities:

- AERC, Alameda
- Evergreen Oil, Alameda
- J &B, Santa Clara
- Metech, Santa Clara
- Noranda, Santa Clara
- ECS/United Data Tech, Santa Clara

. What follows is a county-by-county narrative of the TSDs around the Bay.

ALAMEDA COUNTY

There are currently two TSDs permitted by DTSC in Alameda County as Commercial Offsite Hazardous Waste Management Facilities: Evergreen Oil and AERC.

AERC was founded in 1992 (as Mercury Technologies). In 1993, AERC was issued a standardized permit by DTSC to treat 880,000 pounds per month, or 5,280 tons per year. While most of the wastes received at Mercury Technologies are fluorescent light bulbs and ballasts, they also receive *hazardous* wastes in the form of PCB wastes from older generators being decommissioned. The fluorescent wastes do not arrive under manifest (and thus are not counted as Tanner formula wastes), These wastes, such as fluorescent bulbs, ballasts, antifreeze and batteries are instead considered universal wastes and are shipped under bill of lading.

The treatment process at AERC involves one large, complex piece of machinery, which crushes fluorescent light fixtures and ballasts in a vacuum. The mercury contained in the white powder on the inside of fluorescent tubes is recovered to carbon drums, while the glass is shattered into small shards. The glass is resold. The mercury/carbon is recycled. AERC has another facility in Allentown, Pennsylvania, where the company is headquartered. The mercury recovered in Hayward is transported to Allentown – under manifest since it is now a

hazardous waste – where AERC sells it back to manufacturers PCBs sent under manifest to AERC are repackaged and sent for disposal elsewhere.

AERC is operating well below its permitted capacity. Only 75 tons were accepted in 2002 as compared to the permitted capacity of 5080 tons per year. AERC also disassembles E-wastes, which it views as a big growth area.

Evergreen Oil was established in 1985 in an industrial section of Newark, Alameda County. Evergreen Oil has not had a current operating permit with DTSC since 1990. Nabil Wabeh, Evergreen's Director of Environmental Health and Safety, was recently told by DTSC that the agency is preparing a draft permit, which will then go to a public hearing, before being issued later in 2004.

For the past several years, the Committee has not counted Evergreen's treatment capacity (roughly 65,000 tons/year of waste oil as of 1990) in the Fair Share Formula because the facility only treated waste oil. The Committee has excluded waste oil from the formula the last half decade because of concerns of double counting (a simplified diagram that shows how waste oil may be double counted is presented in Figure I-1). Evergreen states most of its customers are in California. Since it has a Southern California plant as well, it is likely a large percentage of the Newark facility's receipts are from around the Bay Area.

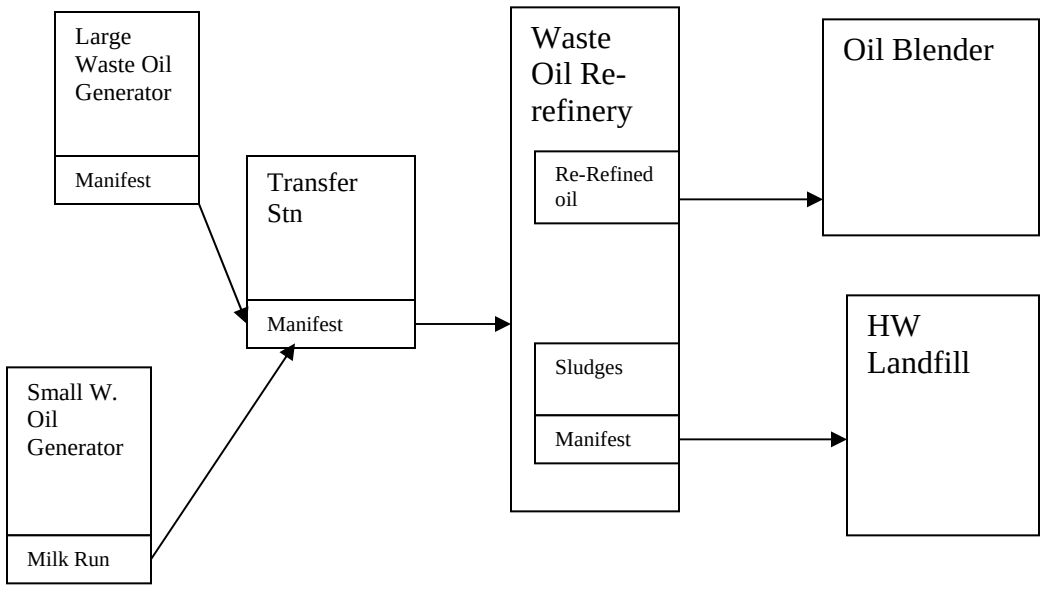
In February 2004, the Committee's Technical Advisory Committee (TAC) met to review a draft of this report. The TAC recommends that ABAG staff beta-test a revised Fair Share Capacity Formula that includes Evergreen's capacity. Further the TAC recommends that staff count waste oil from the nine Bay Area counties, minus waste oil received from local bulking plants.

Additionally, Evergreen is seeking a new treatment permit with DTSC. It has requested a total of 215,900 tons/year in treatment capacity as follows:

- Tripling their fuel blending treatment (recycling waste oil)
- Doubling their re-refining treatment (another waste oil recycling process)
- Bringing on line two new non-waste oil processes:
    - consolidating/solidifying/repackaging drums (similar to what Romic of San Mateo does)
    - wastewater treatment (similar to Romic and Clean Harbors).

Assuming that DTSC issues the permit along the lines requested by Evergreen, the facility's and the region's capacity to treat hazardous wastes will increase significantly.

Figure I-1: Waste Oil Manifesting (Manifested HW is counted)



Technichem of Emeryville was interviewed by staff just before the facility closed on December 31, 2003. According to Charlene Williams of DTSC, the Department found Technichem to have had many serious violations from 1997 to 2002, one of which was exceeding its permitted treatment capacity (the facility had applied to have its permitted capacity increased). In 2002, a judge ruled in favor of DTSC and issued Technichem a penalty of $1.4 million. Technichem then settled the entire case: it withdrew its application for a capacity increase, closed its facility in Emeryville, and opened a new plant in Nevada.

PhibroTech, which had been in operation between 2002 and 2003, was a hydro-metallic refinisher owned by Phillip Brothers Chemicals in New Jersey. The facility, which had been permitted for 15,000 tons per year, is now closed.

Allied Technologies, though it was listed on DTSC's 2002 list of Commercial Offsite Hazardous Waste Management Facilities, never seems to have gotten off the ground.

SANTA CLARA COUNTY

Santa Clara County has six permitted Commercial Offsite Treatment Facilities as of 2002/2003. Five of the six facilities are metals reclaimers: companies that buy large volumes of electronic equipment and separate the precious metals for

resale. Among the facilities visited, the processes were very similar to the five steps described by Joe Fulton of Metech (site visit of 1/12/04):

- Shred the metal scrap
- Roast at 1400 degrees F (they have an afterburner at 1800 degrees F)
- Mill and Screen
- Assay for metals content
- Smelt metals with copper

J&B of Santa Clara transports and reclaims precious metals: nickel, silver, copper, lead, palladium. The facility is permitted to treat roughly 2400 tons/year of hazardous waste. After reclaiming the metals from all kinds of electronics and telecommunications parts, J&B sells the re-refined bouillon to recyclers at locations throughout the world.

Metech of Gilroy reclaims materials from OEMs (original equipment manufacturers), telecommunications equipment, jewelers, and glass manufacturers. Metech's permitted capacity is 3100 tons per year. 75% of the wastes they process (by weight) is E-wastes; 70% of their customers are local. Only 25% is hazardous wastes. It is the hazardous wastes – i.e. the plating solutions, wipes, and rags from electronics assembly plants – that DTSC regulates. The parent company is in Mapleville, Rhode Island. Metech is ISO 9001 and 14001 certified. Metech has talked to Santa Clara County about being recognized as a Green Business.

Noranda of San Jose (formerly MicroMetallics, founded in 1974) also reclaims metals from OEMs. Their permitted capacity is 298 tons/year. The company is owned by a company based in Ontario, Canada. They have a sister facility in Rhode Island. Several years ago they initiated a joint venture with Hewlett Packard in Roseville, where they collect and re-reclaim metals from HP E-waste. DTSC permits several waste streams at Noranda: acid metals waste, alkaline metals waste, silver residue, and silver sludge.

ECS/United DataTech, with a permitted capacity of over 10,000 tons per year, is the largest metals processor in Santa Clara. The company reclaims lead solder dross, silver solution from photo-processing, and metals from a large (and expanding) variety of E-wastes. However, the Santa Clara plant is the smaller of ECS' two American plants: the facility in Terrell, Texas is much larger. According to the ECS website, the company, founded in 1980,

> Maintains a state-of-the-art, environmentally permitted recycling facility that provides a broad range of metals recycling services, tailored to meet the individual needs of our customers…ECS Refining provides environmentally correct reclamation solutions for an abundance of regulated and non-regulated metal-bearing wastes. We adhere strongly to a 100% no landfill policy. Our professional Environmental Staff provides

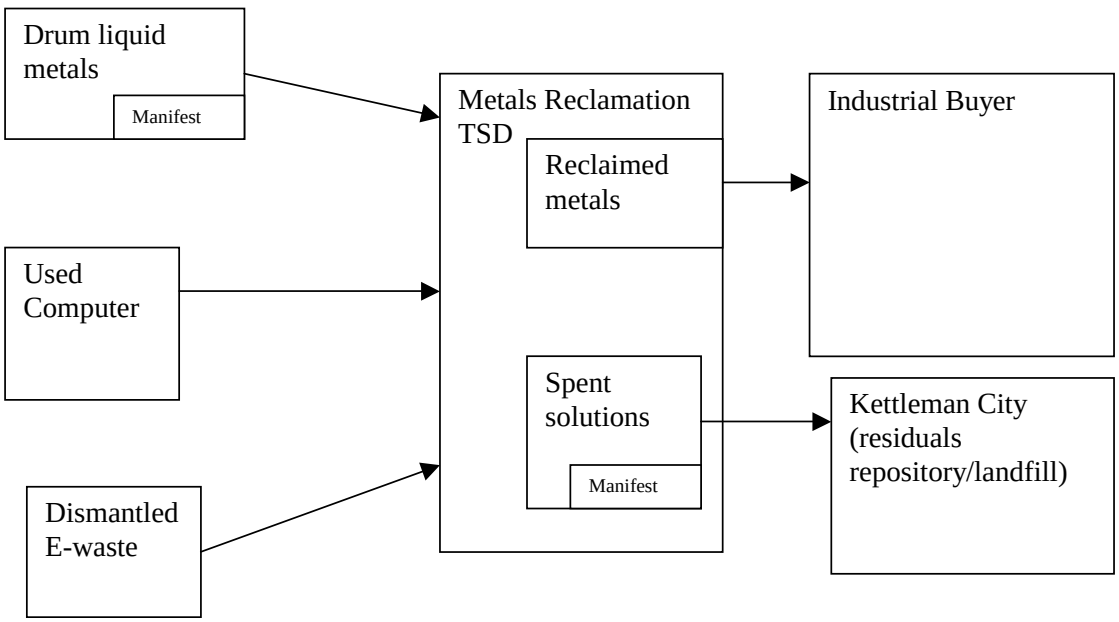
training, monitors facility compliance, tracks environmental regulations and is available to provide council and information to clients.

Tom Hogye, Vice President/General Manager, pointed out in a facility tour that when it comes to E-waste, the company's first attempt to recycle it is to sell the machines to refurbishers. In cases where refurbishing is not an option, then the company shreds the machines, assays lots to determine metals content (a several step process) and ships the shredded e-waste to a primary smelter (such as Noranda in Canada). Mr. Hogye noted that ECS has no local regulatory constraints and can process as much E-Waste as possible given the standard work week and the equipment's overall capabilities. They are constrained by standards that limit smelting leaded glass at full capacity in the Texas facility.

Wit Refining has been in business since 1982. It is the smallest metals reclaimer in the Bay Area with a permitted capacity of 360 tons per year.

Figure I- 2 shows a typical manifesting scenario for solid waste metals and E-wastes. E-Wastes are not manifested like waste plating solutions. Plating wastes and photo-chemical wastes are manifested when they leave a generator; E-wastes are not. However, if a TSD reclaims E-wastes under current technologies: i.e. if the TSD removes metals in a bath, then the bath sludges will be hazardous wastes. Similarly, if a TSD shreds and roasts E-wastes to sample it (as does ECS and Metech) before sending the wastes to a primary smelter, the baghouse wastes will be hazardous as well.

Figure I-2: Manifesting of Metals Wastes to Metals Reclaimers



Clean Harbors (formerly Safety Kleen) has been a permitted TSD since 1974. The current owner is based in Massachusetts. DTSC permits four separate processes: two wastewater treatment methods, lab packing, and fuel blending. According to Andy Berna-Hicks, DTSC's current permit writer for the facility (phone conversation March 15, 2004), last year Clean Harbors was issued a permit to treat 192,000 gallons per day. If the facility operated 300 days per year, its capacity would be 230,400 tons/year. Berna-Hicks stated that the facility appealed the permit, and it is currently under review; however, capacity is not an issue under consideration.

Like Alameda County, Santa Clara had a number of facilities go out of business over the last few years. These included: **Safeway Chemicals** (which seems to have been a small company), **Ionization Research Solutions/EcoSolutions** (which never processed much waste and which was acquired by Stericycle, the medical waste treatment company), and **Depressurized Technologies** (an aerosol can recycler). Depressurized Technology's Nevada plant had an explosion in March 2002, where a worker died. The company appears to be out of business entirely.

SAN MATEO

Romic Environmental did not return phone calls or complete the survey. Based upon material reviewed on the internet and in the permit file at DTSC, Romic has operated a facility in East Palo Alto since 1963. The plant is currently owned by US Liquids.

DTSC staff Evalia Rodriguez directed ABAG staff to a fact sheet issued by DTSC, *Update of Activities, Romic Environmental Technologies Corporation, June 2003*. This fact sheet states that Romic receives and treats waste solvents, such as paint thinner or alcohol, antifreeze, wastewaters, and other hazardous wastes such as discarded paints or oils. The facility treats solvents by a variety of processes including distillation, think film evaporation, fuel blending, wastewater treatment, lab packing and liquefaction. Some products that are made from these processes can be shipped to cement manufacturers to be burned in place of natural gas or coal.

The fact sheet further notes that Romic has applied to increase their capacity from 186,000 tons/year to 211,500 tons/year assuming the plant operates on 300 days/year. The newly proposed units include tanks that were previously permitted but never installed as well as new units, including a consolidation booth, debris shredder, can crusher, drum wash, aerosol depressurization unit, and a truck wash unit. Rodriguez stated that DTSC is working on issuing the draft permit/EIR for Romic. DTSC hopes to post a Public Notice in June 2004.

Romic has another recycling plant in Chandler, Arizona. It is possible that if the plant does not receive the requested capacity increase in California, that it will transfer additional capacity to Arizona.

Summary of Findings

1) There are currently nine permitted commercial TSDs, most of which have been in business for at least a decade. Some of these longstanding businesses have expanded to treat additional waste streams and/or expanded their treatment capacity. New facilities have tried to build businesses in the Bay Area, but these have been unsuccessful. While the individual reasons for the new companies' failure have varied, this local trend mirrors a national trend of fewer large facilities with expanded waste streams.

2) Six Bay Area TSDs are metals recyclers with some E-waste component. It is interesting to note that E-wastes do not arrive at a facility under manifest and are not counted in the Fair Share Capacity Formula. However, in the E-waste recycling process, some hazardous wastes may be generated. Such wastes leave the TSD under manifest. E-waste recyclers are optimistic about their growth potential; however, they are concerned about the timing and substance of forthcoming E-waste recycling regulations.

II. CLASSIFICATIONS OF HAZARDOUS WASTE TREATMENT FACILITIES UNDER THE FAIR SHARE FORMULA

The Fair Share Formula in use since 1990, assumes that certain types of hazardous wastes are treated by certain treatment methods. The methods are as follows:

Aqueous metals
Other recycling
Aqueous organics
Incineration
Residuals Repositories
Stabilization
Solvent Recovery
(and until the mid 1990s) Oil Recovery

However, the manifesting system that tracks wastes from cradle to grave, has different treatment codes than the ones above. It uses the following categories:

Disposal, injection well
Disposal, land application
Disposal, landfill
Disposal, other
Disposal, surface impoundment
Recycler
Treatment, incineration
Treatment, tank

Because of this discrepancy, the Committee reviews theoretical treatment methods that are not easily verifiable. This report recommends tracking hazardous wastes from cradle to grave in the Fair Share Formula, rather than using non-verifiable treatment methodologies.

The following paragraphs describe how the historical Fair Share Formula's information would be modified. For additional information about hazardous waste treatment methods, please see Appendix C.

Incineration: Incineration is common parlance for a variety of thermal treatment technologies, which include burning hazardous wastes as a feedstock at cement kilns. The fair share formula assumed that the following waste types would be incinerated: PCBs and dioxins, various sludges, adhesives, and resins. According to recent manifests, these are landfilled, recycled and incinerated, with landfilling and recycling being more common than incineration.

Stabilization: Stabilization is the reduction of mobility and/or toxicity of contanimants in the waste to improve the handling characteristics, and/or

prepare the waste for disposal into landfills. Under the fair share formula, hazardous wastes to be stabilized include laboratory wastes, chemical toilet wastes, household hazardous wastes, bag house wastes, and drilling muds. In fact, the most recent manifest data show that lab wastes are largely incinerated, chemical toilet wastes are (somehow) recycled, bag house wastes are landfilled, and household hazardous wastes receive a variety of treatments.

Residuals Repositories: A residuals repository is an above ground or below surface storage site for hazardous wastes that need to be kept separated from one another. The repository would not necessarily be for hazardous wastes directly, but would be for the bi-products of hazardous wastes that could not be further recycled or processed.

The fair share formula assumes that hazardous waste can only be imperfectly treated, and that there will always be residual waste. For example, it is assumed that for every ton of waste stabilized, an additional half-ton of waste will go to a repository, and that 10 percent of wastes recycled will need to go to a repository landfill.

ABAG staff attempted to get information about the quantity of "residuals" shipped offsite from Bay Area TSDs. However, facilities did not have such a number readily available. None of the facilities thought they shipped as much as 10 percent of their wastes for landfilling or further treatment. Since wastes leaving regional TSDs under manifest are counted in the formula as “generated wastes,” it seems duplicative to leave in a special residuals category.

Aqueous Organics Treatment: The fair share formula categorizes a specific treatment type for pesticides and pesticide-contaminated water as “aqueous organics.” According to the various treatment technologies reviewed in Appendix C, oxidation and reduction processes would be used to render pesticides less toxic. However, a review of recent manifest data indicates that pesticide wastes are largely landfilled (some are incinerated or treated).

Aqueous Metals: Aqueous metals treatment is what most of the South Bay metals reclaimers do; they remove precious metals from solutions. Manifest data shows such wastes to be largely recycled; although some are treated in tank, some incinerated, and some landfilled.

Solvent Recovery: Solvent recovery techniques remove contaminants from solvents and blend the mixtures into solutions that can be re-used or sent as feedstock to incinerators. The fair share formula designates a variety of solvents, both halogenated and non-halogenated, as materials to be sent to solvent recovery facilities. The Bay Area has two facilities that recover solvents: Clean Harbors and Romic, and the Bay Area has ample treatment capacity in this category. Manifest data show that most of these compounds are recycled, treated in a tank, or incinerated.

Other Recycling: This refers to wastewater for wastes that are non-solvent and non-pesticide liquids. Both Clean Harbors and Romic process such wastes in large volumes. Manifest data show that most of these compounds are recycled, treated in a tank, or landfilled.

Findings

1) The hazardous waste treatment technologies in use by Bay Area facilities, like those used by facilities elsewhere in the US do not seem to have changed significantly over the past decade. They include: disposal (landfills, etc.), recycling, and treatment (by chemical or physical means).

2) Manifest treatment designations (recycle, treatment tank) and historical fair share formula categories (aqueous metals, other recycler) are not easily compared. It is not clear that the original fair share categories are useful in assessing the types of treatment needs to meet the hazardous waste generation trends in the Bay Area.

3) Using data from hazardous waste manifests, the formula can be amended to track wastes from cradle to grave. This will make information in the formula more transparent and in sync with actual hazardous waste treatment trends.

III PROPOSED MODIFICATIONS TO THE FAIR SHARE FORMULA

Table III-1 on page 14 shows the current capacities of Bay Area TSDs based uponthe facility surveys, a review of information in DTSC files, and on the information found on the internet posted by the TSDs.

The TAC recommends acceptance of the new capacity levels. However, it is important to bear in mind two caveats to these capacity figures:

- TSDs are generally issued a permit to treat X gallons per day or per month, or Y pounds per day or per month. Because the Fair Share Formula considers total tons of waste generated per year, ABAG staff converts gallons per day or per month to tons per year. When a daily number is assigned ABAG assumed 300 days of operation each year. However, it is possible that materials must stay in holding tanks longer than 24 hours, regardless of permit conditions.
- Based upon site visits, permitted capacity seems less constrained by equipment and design than on a permitting engineer's assumptions about how much waste a TSD might treat. ABAG and County staff observed similar equipment and designs in different metals reclaimers, that had widely different capacity limits from DTSC. It is possible that these facilities have the equipment to treat greater amounts than their permit indicates.

In addition to the capacity changes, the TAC recommends the modifications to the Fair Share Formula summarized below.

1. Residuals: Because wastes shipped from TSDs for further treatment are counted in the overall generated wastes of the nine-county Bay Area, it is redundant to continue to add the residuals factor. The TAC recommends removing the residuals factor from the Formula.

2. Categories: As noted in the findings in the previous section, the mis-match of fair share formula categories for waste treatment and actual waste treatment designations from manifest data prevents the Committee from understanding what actually happens to hazardous wastes in the Bay Area. The TAC recommends reclassifying facilities into one of the following four categories: disposal, treatment, incineration, and recycling. Then it will be possible to track actual treatment types (designated on the manifests) against the capacity of the facilities.

3. Facility Allocation for Counties: To conform with the adoption of new treatment categories in the formula, the TAC recommends reclassifying the types of facilities that counties would need to site: The ninth and eighth ranked counties (the ones with the largest deficit) would need to site a landfills or other facility to isolate hazardous residuals; the seventh ranked county, an incinerator;

all other counties with a deficit would site recycling facilities. (Injection wells, as is noted in Appendix C, are amenable only to certain geologic conditions.)

4. Facilities: The list of facilities considered for the fair share formula historically does not include one TSD, Evergreen Oil, because the wastes it treats, waste oil, is rampantly over-counted (when it leaves the generator, as well as several bulking stations). However, the TAC recommends counting Evergreen's capacity, and if Evergreen's new permit is approved, increasing Evergreen's capacity. The list of facilities has historically counted photowaste and x-ray processors. DTSC does not currently include these facilities on the commercial offsite treatment facilities list; they have a precious metals exemption. The TAC recommends the Committee continue to count these facilities.

TABLE III-1
BAY AREA TSD CAPACITY, 2003

County	***Facility***	*Recycler*	*Disposal*	*Treatment*	*Incineration*	*Capacity Last Report (tons)*	*Average HW 99/02 (tons)*	*HW 02 (tons)*
Alameda	Diagnostic Imaging	264						264
Alameda	Evergreen	94,000					84,250	71,036
Alameda	AERC	5,280				4,107	36	75
Alameda	Philips Medical System	123						123
Marin	Photo Waste Recycling	826				2,430	389	826
San Mateo	Romic	175,000		11,000		58,000	36,236	39,055
San Mateo	Merry X Ray	109				101	109	87
Santa Clara	Micro Metallics/Noranda	288				87	35	37
Santa Clara	Metech	3100				500	91	101
Santa Clara	J&B	2400				1,533	496	941
Santa Clara	ECS Refining/United Datatech	10,140				5,000	1,971	1,171
Santa Clara	Clean Harbors	220,000		10,400		64,936	18,767	19,821
Santa Clara	Wit Refining	360				250	5	4

IV. TRENDS & ISSUES IN SITING FACILITIES

Overview

The goal of the Committee is to ensure that hazardous waste treatment facilities in the Bay Area are sited according to a rational planning formula that ensures that no county receives more than its "fair share" of TSDs. Currently, three of the nine Bay Area counties have the permitted TSDs: Santa Clara, San Mateo, and Alameda. In 1990, at the inception of the Committee, San Francisco had a TSD, and a facility was attempting to start up in Contra Costa county. Today, neither of these counties have treatment capacity. Solano, Contra Costa, Napa, and Sonoma counties have never had TSDs. Marin County has a photo waste recycler, which is not listed by DTSC as a Commercial Offsite Treatment Facility; however, it has been historically counted by the Committee as one of the regional treatment facilities.

To date, ABAG is not aware that any unwanted TSD has sought to locate in the nine-county Bay Area. However, ABAG has learned that the City of Emeryville opposed the permit re-issuance and expansion of Technichem, a dry cleaning solvent recycler. The city wrote to DTSC:

> …A facility like Technichem can only work here if it is appropriately located given surrounding land uses; if it operates properly and in conformance with applicable laws; and if its impacts have been adequately reviewed. At this point, we do not believe this is the case with Technichem and strongly urge you to reconsider the issuance of a Final Permit to Technichem at this time. In fact, Technichem is currently operating beyond the acceptable cancer risks determined by the BAAQMD and should have its operations restricted to acceptable health risk levels immediately. (Letter July 6, 2001 Lynn Tracy Nerland, Emeryville Assistant City Attorney)

On the other hand, AERC's Charles Landmesser stated that the City of Hayward offered invaluable assistance in finding additional warehouse space to keep the company from relocating.

Most of the nine TSDs surveyed cited the DTSC permitting process as the biggest regulatory hurdle to expanding capacity. ECS stated that it recently expanded in Texas, which has an easier regulatory climate than California. PhibroTech closed its Bay Area facility but has a large facility on the East Coast.

Both within and beyond the Bay Area, it seems the trend is for large facilities to become larger, as is the case with Evergreen, Romic and Clean Harbors. Steve Armann, Manager of the RCRA Permits Program at US EPA Region 9 says that TSDs nationwide are broadening their services to be able to take new hazardous waste streams as old waste streams are drying up.

Incinerators

An EPA database lists 164 permitted and interim status incinerators nationally, 21 of which are commercial[1]. An online search engine, Envirofacts, part of the EPA website, lists four commercial TSDs that offer incineration in Region 9: one in Arizona, one in Nevada (U.S. Ecology), and two in California (Kettleman City and a cement kiln in the Central Valley). Searching Envirofacts for hazardous waste landfills in Region 9, the expected names appear: Buttonwillow (now owned by Clean Harbors) Kettleman City (still owned by Chemical Waste Management) and US Ecology in Nevada.

According to Steve Armann, siting a large TSD is onerous anywhere in the US. A Google search for “hazardous waste incinerators” turns up many websites for environmental organizations opposed to incineration, a few advertisements for companies that offer soil incinerators for site cleanups, and a sprinkling of links to US EPA websites. A hazardous waste generator would have a hard time locating an incinerator through the internet.

For all those reasons, it seems unlikely that a large incinerator or landfill would look for space in this region. What does seem possible, depending upon E-waste regulations, is that the Bay Area’s currently operating TSDs would increase their permitted capacity to process more E-wastes.

Electronic Waste

Matthew McCarron of the California Integrated Waste Management Board (CIWMB) summarized provisions of the draft regulations under consideration to implement SB 20, the Electronic Waste Recycling Act of 2003. Under SB 20, a six to ten dollar fee associated with the purchase of monitors or laptops (currently estimated to be $8 million annually) will finance California's E-waste recycling initiative. The main components of the initiative are manufacturer reporting, consumer education, and fees to local governments to support local collection and recycling efforts. These regulations were written with cathode ray terminals (CRTs) and televisions, considered hazardous waste due to their lead content, in mind.

The state's goals are to support local governments who have the responsibility of ensuring that E-waste gets picked up and disposed of/recycled, that the state's locally based "deconstructors," including those in the Bay Area, remain in

[1] http://www.epa.gov/epaoswer/hazwaste/combust/general/universe.txt (list from 1994)

business, that the re-use markets are bolstered not destroyed, and that California's fees are not used to dispose of dumped monitors from adjoining states.

McCarron noted that the CIWMB and DTSC are collaborating on regulations regarding LCDs, laptop computers, and other E-waste not covered under SB 20. He is optimistic that state-based E-waste recyclers and dismantlers will not be excluded from this burgeoning group of wastes. In the next five to ten years, it seems likely that E-waste deconstructors will continue to be located around the San Francisco Bay. How large of an industry it becomes in the long run depends on Federal rulemaking as well as state activities.

V. CONCLUSIONS

In the Fall of 2003, ABAG staff in cooperation with the Hazardous Waste Management Facility Allocation Committee, surveyed the TSDs in the San Francisco Bay Area. The goals of the project were to:

- propose updates to the Fair Share Formula
- learn more about the treatment capacity in the Bay Area to know what changes in capacity might be expected in the next decade
- compare the types of TSDs in the Bay Area to those throughout the country in regards to the modernity of operations, capacity, and other available areas of comparison
- examine trends in siting facilities

Findings

1) There are currently nine Commercial Offsite Treatment Facilities in the San Francisco Bay Area. New facilities, such as Allied Technologies and Ecosystems, have attempted to open in the Bay Area, but the businesses do not seem to have been viable. While the individual reasons for the new companies' failure have varied, this local trend mirrors a national trend of fewer large facilities with expanded waste streams
2) While the number of TSDs has declined, permitted capacity in the nine-county Bay Area will likely increase because Evergreen, Romic and Clean Harbors have expanded or are seeking to expand treatment capacity.
3) It is extremely unlikely that a new large commercial TSD would want to open in the San Francisco Bay Area. Such TSDs encounter siting difficulties throughout much of the country. Rather, existing TSDs are expanding capacity.
4) TSDs that reclaim precious metals are the most prevalent type of TSD in the Bay Area but compared to Romic and Clean Harbors they have small permitted capacity. Within the last several years, these metals reclaimers cite a weak economy, and the movement of computer production facilities abroad, as the main reasons that business is down (fewer hazardous wastes processed), and that they are not interested in increasing capacity.
5) The metals reclamation TSDs are very interested in capturing the E-waste market. Currently E-waste is not included as part of the Fair Share Formula because E-waste does not require a manifest. However, some E-waste, once processed by a local TSD, may need a manifest when it leaves the local TSD.
6) Metals reclaimers are concerned about how E-waste disposal will be regulated in the future by the state and federal governments. Local TSDs would like to remain local and process larger volumes of E-waste.

The Fair Share Formula used by the Committee does not align well with the categories used to track hazardous wstes from cradle to grave. Four changes

have been proposed to Fair Share Formula, which will simplify the categories of TSDs, aligning them with the categories used in the manifests.

Recommendations

1) Accept findings of report, including the five changes to the Fair Share Formula, and use the revisions in Fair Share Formula on test basis for current and next years' data analyses

2) Track E-waste regulatory issues closely to ensure Committee is kept abreast of emerging trends. DTSC has classified E-wastes as universal wastes, a subset of hazardous wastes with reduced management and transportation requirements. E-Waste regulatory concerns now in play include financial incentives for E-waste recycling, local government responsibility initiatives, and regulatory program (DTSC) changes.

3) Task Committee or local agency staff to update the Committee periodically on the status of Bay Area TSDs (i.e. maintain a more active ongoing relationship with them). This will allow the Committee to stay abreast of regulatory and market pressures regarding E-wastes and other emerging classes of hazardous wastes.

4) Continue to look at local hazardous waste issues that are outside of the scope of DTSC's annual reports. This report is an example of one such study. Other issues that may be considered for future studies include:

- local policy considerations in hazardous waste management facility siting, expansion and/or management;
- regional hazardous waste minimization efforts; and
- local emerging hazardous waste treatment/recycling developments.

Another example of an emerging issue that may have very significant impacts on Bay Area hazardous waste generation levels is E-Wastes. If the TSDs that process E-wastes are successful, then Alameda and Santa Clara counties may see large increases in hazardous waste generation. These increases would not be due to new process inefficiencies at the TSDs, but rather as a bi-product of recycling E-waste (which as a universal waste is not received under manifest).

APPENDIX A

WORKPLAN

Updating Information on Bay Area Treatment Facilities, Tanner Hazardous Waste Treatment Capacity Categories, and Tanner Planning Assumptions for Treatment Facilities

Background: ABAG has been collecting information on the Bay Area's hazardous waste generators and treatment facilities, per AB 2948 (Tanner), since 1990. Since the initiation of this effort, the Bay Area has had a treatment capacity deficit relative to industrial hazardous waste generation. According to a list provided by Cal EPA Department of Toxic Substances Control (DTSC), the Bay Area had 18 treatment facilities as of 2001. Some facilities were new to the list (i.e. had received local siting permission without notification to ABAG). It is possible that other facilities are being approved and will appear on the list in the future; it is also possible that projects are being rejected locally. ABAG's information on the facilities, their treatment capacity and their treatment processes is limited. Tanner planning assumptions have not been updated since the local hazardous waste plans and the regional Interjurisdictional Agreement (IJA) were adopted by counties in the early 1990s. ABAG proposes to update information on the treatment facilities to provide counties and the region with a more accurate picture of management capacity. This work could lead to updating the allocation formula to better reflect current conditions.

Summary of Project Proposal: This project has four primary components:

(1) To research Bay Area hazardous waste management facilities to clarify local government's understanding of their current operations (capacity, amount and types of waste treated, source of wastes, principal industries generating the wastes, residuals produced in treatment) within the context of regional hazardous waste plans.
(2) To compare information on local waste treatment technologies with state-of-the-art treatment processes to gauge how well local treatment capacity compares with treatment outside the region.
(3) To re-assess Tanner planning capacity assumptions and capacity planning categories in light of current capacity locally and beyond.
(4) To research national and state trends in the siting of incinerators and other major hazardous waste management facilities to ensure facilities categories and rankings used in allocation formula appropriately reflect these trends.

The report from this analysis will propose updating Tanner capacity information and facilities categories to align with current trends. It may further propose changing category names to ensure that we are meeting the intent of the IJA – the fair allocation of hazardous waste management facilities in counties with capacity deficits. This work is intended to ensure that the Bay Area continues its proactive position within the state with regards to hazardous waste planning.

Scope of Work:

1. Develop a survey instrument that will be used to interview representatives of the 18 Bay Area treatment facilities. Questions would elicit information on facility size, date of incorporation, primary wastes accepted, source of primary wastes, waste treatment methods, residual products and their ultimate disposal method. The survey would also seek information on emerging treatment technologies for the waste types the facility currently treats – whether new facilities are using new technologies or old facilities are retrofitting. The draft survey would be circulated to DTSC and the Bay Area Air Quality Management District (BAAQMD) for input (and to see what information they have available) and then approved by the Technical Advisory Committee (TAC). (15 hours)

2. Identify contacts and conduct phone survey of all facilities. Follow up with site visits to Evergreen Oil and other facilities in Alameda County (and large facilities in other counties pending approval/funding from said counties). (25 hours to phone all Bay Area facilities and conduct site visits at Alameda County facilities. Additional site visits estimated at 4 – 6 hours per facility depending on location and operation.)

3. Data analysis/progress report. Compile data, look for trends. Compare Tanner Planning Categories with current waste treatment designations (e.g. aqueous organics with whatever Romic calls their process). Evaluate Tanner "capacity" with other constraints (i.e. BAAQMD permits, local permits, generator constraints). Distribute progress report to TAC. (15 hours)

4. Research national and state trends on the siting of incinerators and other major hazardous waste management facilities to ensure facilities categories and rankings used in allocation formula appropriately reflect these trends. (8 hours)

5. Confer with TAC to discuss findings to date and directions for additional research. Present recommendations to Hazardous Waste Management Facility Allocation Committee. Topics to investigate include state-of-the-art hazardous waste treatment technologies – are Bay Area facilities keeping pace with technological improvements, and E-waste – what technologies are available for hazardous components? (15 hours)

Budget and Time Frame: The project's primary researcher would be Jennifer Krebs, Sr. Environmental Planner. Her hourly rate for FY 03/04 is $69/hour. Total labor cost is $5,385. Travel costs $50. Printing (draft reports for TAC and final report for committee) $100. ABAG overhead $2460. Total estimated project cost $7995 to occur over six months.

APPENDIX B

Summary of Interviews and Site Visits with Bay Area TSDs

Facility	**AERC (formerly Mercury Technologies)**		
County	**Alameda**		On DTSC list
Proposed Treatment Group	Recycling		Received Wastes in 2003
Proposed Capacity	5280		Operating At Capacity
Historic Tanner Capacity (Tons)	4107		Has a Fleet to transport HW
Historic Tanner Category(ies)	other recycling		Accepting new waste streams
Wastes Rec'd 02 (tons)	75		Considered expanding
Wastes Rec'd 01 (tons)	48		Problems expanding
Wastes Rec'd 00 (tons)	3	Separates mercury containing lamps into their main components, recovers the mercury, and recycles 100% of the end products. Also recycles batteries, PCB ballasts,HID lamps, misc. mercury containing devices, and computer scraps	
Wastes Rec'd 99 (tons)	17		
Treatment Capacity (DTSC)	1250 lamps/hr		
Wastes (DTSC)	fluorescent lamps	First lamp recycler in US. They currently broker fluorescent lamps, batteries, and PCB ballasts to other processors. Ewastes are disassembled for resale. Flat screen monitors have Hg.	
Treatment Tech. (facility)	mercury batteries retort		
Treatment Throughput (facility)	2,400,000 lamps		
Tanner Treatment Category		Non haz waste treatment onsite: computer waste disassembly. Most of this waste arrives under bill of lading. However, mercury recovered in disassembly leaves under manifest.	
In business at current location	1992		
Home office	Allentown, PA		
Customer Location	9 county	In 12/02 settlement with DTSC for permit violations - $84,000.	
Business Type of Customers	Broad based: homeowners, schools,		
Most restrictive permit	DTSC		
% waste processed on site	100% (2)		
Residuals generated	phosphorous with		
Amount of residuals	25,000 #/year		
What happens to recycled materials?	mercury sold to broker, lamps sold back to industry, E-waste		
Nearest Competition	Ontario, CA		
Reason for Expanding	New market - Ewaste		

Facility	**Evergreen**		
County	**Alameda**		On DTSC list
Proposed Treatment Group		Recycling	Received Wastes in 2003
Proposed Capacity		94000	Operating At Capacity
Historic Tanner Capacity (Tons)			Has a Fleet to transport HW
Historic Tanner Category(ies)		na	Accepting new waste streams
Wastes Rec'd 02 (tons)		71036	Considered expanding
Wastes Rec'd 01 (tons)		85385	Problems expanding
Wastes Rec'd 00 (tons)		86896	Largest waste oil collection and oil re-refining operation in the state of California
Wastes Rec'd 99 (tons)		93685	
Treatment Capacity (DTSC)		30 gls/minute	
Wastes (DTSC)		oil-used	Facility awaiting new permit from DTSC - operating without a permit since 1990. Facility is proposing the increased capacity to be 215,000 tons per year as follows:
Treatment Tech. (facility)		Rerefining and Fuel Blending	
Treatment Throughput (facility)		15,700,000 gallons	
Tanner Treatment Category			Fuel blending to increase from 6-18 million gals per year, re-refining to increase from 50-60 gals per minute, wastewater treatment to be added 55,000,000 gals/year, drum consolidation 10,000 gals/year.
In business at current location		1985	
Home office		CA	
Customer Location		CA	
Business Type of Customers		Auto shops, dealers, oil changers	
Most restrictive permit		DTSC	
% waste processed on site		100	
Residuals generated		solids and catalyst	
Amount of residuals		<5%	
What happens to recycled materials?		blended fuels sold to industry, re-refined oils sold to blenders	
Nearest Competition		LA	
Reason for Expanding		expand capacity	

Facility	**Technichem**		
County	**Alameda**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)		600	Has a Fleet to transport HW
Historic Tanner Category(ies)		solvent recovery	Accepting new waste streams
Wastes Rec'd 02 (tons)		741	Considered expanding
Wastes Rec'd 01 (tons)		580	Problems expanding
Wastes Rec'd 00 (tons)		591	
Wastes Rec'd 99 (tons)		645	
Treatment Capacity (DTSC)		7000 gallons/mo (2,000 gallons perc)	
Wastes (DTSC)		Dry Cleaning Cartridges/Still	New waste streams are PERC alternatives - petroleum distillates, silicon based solvents (Green Earth), Rynex
Treatment Tech. (facility)		steam distillation	
Treatment Throughput (facility)		100 to 1000 tons annually	
Tanner Treatment Category			Issued standardized permit on June 8, 01 to transfer, store, and treat dry cleaning solvent containing hazardous waste. Was operating in exceedance of permit.
In business at current location		1983	
Home office		Local	
Customer Location		west coast	Facility in process of closure. Waste treatment processes re-opening in Nevada.
Business Type of Customers		dry cleaners	
Most restrictive permit		DTSC	
% waste processed on site		100	
Residuals generated		yes to TSD or Fuel	
Amount of residuals		0.5	
What happens to recycled materials?		repackaged and resold from TSD	
Nearest Competition		S Ca	
Reason for Expanding		receive wastes from	

Facility	**Clean Harbors (formerly Safety Kleen)**		
County	**Santa Clara**	On DTSC list	
Proposed Treatment Group	Recycling, Treatment	Received Wastes in 2003	
Proposed Capacity	230400	Operating At Capacity	
Historic Tanner Capacity (Tons)	64936	Has a Fleet to transport HW	
Historic Tanner Category(ies)	other recycling	Accepting new waste streams	
Wastes Rec'd 02 (tons)	19821	Considered expanding	
Wastes Rec'd 01 (tons)	19337	Problems expanding	
Wastes Rec'd 00 (tons)	24660	Three treatment activities on site: inorganic waste treatment, fuels blending/bulking, bulking of lab packs	
Wastes Rec'd 99 (tons)	11250		
Treatment Capacity (DTSC)	20,000 gpd wastewater (inorganic wastewater treatment:		
Wastes (DTSC)	wide range	No longer doing solvent recovery, Per DTSC notice of public comment period: "2500 tons of solid and liquid haz. Waste received annually"	
Treatment Tech. (facility)	wastewater treatment/precipitation		
Treatment Throughput (facility)	0.3		
Tanner Treatment Category		top waste rec'd 02 = oil/water separator sludge (4000tons), acid/metal mix (2k), aqous org (2k), solvents (2k), misc aq sols (2k)	
In business at current location	1974		
Home office	Massachusetts		
Customer Location	CA	Pemit renewed 1/02 for neutralization, oxidation-reduction, thermal stripping, carbond adsorbtion, solidification, flocculation, blending, separation and filtration. New permit in review by DTSC.	
Business Type of Customers	general manufacturing,		
Most restrictive permit	DTSC		
% waste processed on site	100% inorganics,		
Residuals generated	yes		
Amount of residuals	<10%		
What happens to recycled materials?	blended fuels to cement kilns		
Nearest Competition			
Reason for Expanding			

Facility	**ECS Refining, United Data Tech**		
County	**Santa Clara**		On DTSC list
Proposed Treatment Group	Recycling		Received Wastes in 2003
Proposed Capacity	10140		Operating At Capacity
Historic Tanner Capacity (Tons)	5000		Has a Fleet to transport HW
Historic Tanner Category(ies)	Aqueous Metals		Accepting new waste streams
Wastes Rec'd 02 (tons)	1171		Considered expanding
Wastes Rec'd 01 (tons)	1656		Problems expanding
Wastes Rec'd 00 (tons)	2376	"Precious metal destruction and photo waste processing (gold, silver, palladium and platinum recovered from curcuit boards), tin/lead melting for solder, silver recovery.	
Wastes Rec'd 99 (tons)	2683		
Treatment Capacity (DTSC)	12 cf/batch		
Wastes (DTSC)	sludge with silver and cyanide	Facility wants to expand to accept more Ewaste but regulatory support/funding for Ewaste recycling still not there.	
Treatment Tech. (facility)	silver recovery/treatment		
Treatment Throughput (facility)	0.4		
Tanner Treatment Category			
In business at current location	1980		
Home office	Santa Clara		
Customer Location	40% Bay Area	They decided to expand and diversify in TX where the requirements are less onerous	
Business Type of Customers	electronics, photo ops		
Most restrictive permit	DTSC		
% waste processed on site	100		
Residuals generated	oil from vehicles,		
Amount of residuals	less than 10%		
What happens to recycled materials?	sent to smelter or resold		
Nearest Competition	Bay Area		
Reason for Expanding	Expanded TX facility		

Facility	**J&B**		
County	**Santa Clara**		On DTSC list
Proposed Treatment Group		Recycling	Received Wastes in 2003
Proposed Capacity		2400	Operating At Capacity
Historic Tanner Capacity (Tons)		1533	Has a Fleet to transport HW
Historic Tanner Category(ies)		Aqueous Metals	Accepting new waste streams
Wastes Rec'd 02 (tons)		941	Considered expanding
Wastes Rec'd 01 (tons)		256	Problems expanding
Wastes Rec'd 00 (tons)		404	"Environmentally safe recycling of precious metal: A permitted facility and transporter"
Wastes Rec'd 99 (tons)		384	
Treatment Capacity (DTSC)		50,000 gals/mo	
Wastes (DTSC)		solutions with metal	Applied for a permit to "store, and treat HW from the electronics industry in the form of liquid and solid metal-bearing wastes" in 2001.
Treatment Tech. (facility)		Electrowinning/Precip	
Treatment Throughput (facility)		0.6	
Tanner Treatment Category			Per Ken Epsman, they are the newest TSD in Cal, since their expansion two years ago. 40-50% of their historic customers have moved their operations to China.
In business at current location		1999	
Home office		Bay Area	
Customer Location		CA/Western US	Consent Order 11/01 for operating an unpermitted concentrator unit. Fined $5250.
Business Type of Customers		general manufacturing	
Most restrictive permit		DTSC	
% waste processed on site		80	
Residuals generated		no	
Amount of residuals			
What happens to recycled materials?		shipped to intermediary	
Nearest Competition			
Reason for Expanding			

Facility	**Metech (formerly Bolliden Metech)**		
County	**Santa Clara**		On DTSC list
Proposed Treatment Group	Recycling		Received Wastes in 2003
Proposed Capacity	3100		Operating At Capacity
Historic Tanner Capacity (Tons)	500		Has a Fleet to transport HW
Historic Tanner Category(ies)	Aqueous Metals		Accepting new waste streams
Wastes Rec'd 02 (tons)	101		Considered expanding
Wastes Rec'd 01 (tons)	50		Problems expanding
Wastes Rec'd 00 (tons)	82	"Precious and base metal recovery, de-manufacturing, and asset recovery services" "Asset management" = sampling for metal content and selling	
Wastes Rec'd 99 (tons)	132		
Treatment Capacity (DTSC)	100 gpd		
Wastes (DTSC)	Acid solutions with metals	25% of business is arrives as HW, 75% of business is mainframe computers, cell phones, CPUs which arrive under bill of lading, are disassembled and the metals recovered.	
Treatment Tech. (facility)			
Treatment Throughput (facility)			
Tanner Treatment Category		ISO 9001 and 14001 certified. Interested in becoming Green Business.	
In business at current location	1985		
Home office	Mapleville RI		
Customer Location	70% Bay Area	Consent order 11/01 for exceeding storage capacity. Fined $20,500. In 1990s previous owners found guilty of conspiracy.	
Business Type of Customers	Original Equip Manufacturers off spec		
Most restrictive permit	DTSC		
% waste processed on site	100		
Residuals generated	none since 2001		
Amount of residuals			
What happens to recycled materials?	sold to smelters		
Nearest Competition	Micro Metalics		
Reason for Expanding	end of line electronics		

Facility	**Micro Metallics - Noranda**		
County	**Santa Clara**	On DTSC list	
Proposed Treatment Group	Recycling	Received Wastes in 2003	
Proposed Capacity	288	Operating At Capacity	
Historic Tanner Capacity (Tons)	87	Has a Fleet to transport HW	
Historic Tanner Category(ies)	Aqueous Metals	Accepting new waste streams	
Wastes Rec'd 02 (tons)	37	Considered expanding	
Wastes Rec'd 01 (tons)	40	Problems expanding	
Wastes Rec'd 00 (tons)	46	Noranda is a Canadian Copper mining company - they got into recycling when their copper mine played out. The ewaste is crushed and burned, then metals are reclaimed into bullion. After sorting and separation, metals go to	
Wastes Rec'd 99 (tons)	14		
Treatment Capacity (DTSC)	24 tons/month		
Wastes (DTSC)	Acid solutions with metals	SJ Facility owned by Noranda since 1984. E-waste is facility's bread and butter, particularly OEMs re-manufacturing. They currently recycle 1500 tons/year of E-Waste scrap, could do 2.5 times that volume.	
Treatment Tech. (facility)	precipitation		
Treatment Throughput (facility)			
Tanner Treatment Category		Per Cindy Thomas of Noranda, "this is a business we have targeted for growth"	
In business at current location	1974		
Home office	Toronto,Canada		
Customer Location	International	Noranda opened new Roseville disassembly plant for HP	
Business Type of Customers	Semiconductors & electronic mainly		
Most restrictive permit	DTSC		
% waste processed on site	100		
Residuals generated	yes		
Amount of residuals			
What happens to recycled materials?	goes to gold refinery or parent company smelter		
Nearest Competition			
Reason for Expanding			

Facility	**Wit Refining**		
County	**Santa Clara**		On DTSC list
Proposed Treatment Group	Recycling		Received Wastes in 2003
Proposed Capacity	360		Operating At Capacity
Historic Tanner Capacity (Tons)	250		Has a Fleet to transport HW
Historic Tanner Category(ies)	Aqueous Metals		Accepting new waste streams
Wastes Rec'd 02 (tons)	4		Considered expanding
Wastes Rec'd 01 (tons)	9		Problems expanding
Wastes Rec'd 00 (tons)	4	Recovery from "vapor deposition fixtures and sputtering shields; PCB and Semiconductor scrap and parts; metal bearing solutions and cyanide, iodine, sulfite, drag out; high purity Au, Pt targets" generated by circuit board	
Wastes Rec'd 99 (tons)			
Treatment Capacity (DTSC)	300 gpd		
Wastes (DTSC)	cynide sol with metals	business down as semiconductor business is slow	
Treatment Tech. (facility)	precious metals recovery		
Treatment Throughput (facility)	1		
Tanner Treatment Category			
In business at current location	1982		
Home office	Local		
Customer Location	Local	Consent Order 7/9/02 because they stored HW over 1 year. Fined $4,000	
Business Type of Customers	printed circuit boards/semiconductors		
Most restrictive permit	DTSC		
% waste processed on site	95		
Residuals generated	yes, sent offsite		
Amount of residuals	<10%		
What happens to recycled materials?	shipped to intermediary		
Nearest Competition			
Reason for Expanding			

Facility	**Romic**		
County	**San Mateo**		On DTSC list
Proposed Treatment Group	Recycling, Treatment		Received Wastes in 2003
Proposed Capacity	185414		Operating At Capacity
Historic Tanner Capacity (Tons)	58000		Has a Fleet to transport HW
Historic Tanner Category(ies)	Aqueous Organics		Accepting new waste streams
Wastes Rec'd 02 (tons)	39055		Considered expanding
Wastes Rec'd 01 (tons)	33024		Problems expanding
Wastes Rec'd 00 (tons)	37276	Receives waste solvents, antifreezes, waste water, discarded paints and oils, and "provides full service waste management of chemicals, solvents, and waste water	
Wastes Rec'd 99 (tons)	35589		
Treatment Capacity (DTSC)	155000 gpd liquids and 85 tons/day solids proposed		
Wastes (DTSC)	misc acid/alk solutions	Acids and bases sent to AZ facility. Non recyclable waste is incinerated, landfilled or deep welled.	
Treatment Tech. (facility)	Distillation, thin film evaporation, fuel		
Treatment Throughput (facility)			
Tanner Treatment Category			
In business at current location	1963		
Home office	US Liquids Inc.		
Customer Location			
Business Type of Customers		DTSC currently evaluating their permit application - they have 55 treatment units, want to add 18 new ones to process extra 85 tons/day of solids (up to 2,167,500 tons/year). This may be approved by end of 2004.	
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?	returned to sender or blended into feedstock for cement kiln		
Nearest Competition			
Reason for Expanding			

Facility	**Allied Technology**		
County	**Alameda**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)	4800		Has a Fleet to transport HW
Historic Tanner Category(ies)	Other recycling		Accepting new waste streams
Wastes Rec'd 02 (tons)			Considered expanding
Wastes Rec'd 01 (tons)	0		Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)			
Treatment Capacity (DTSC)	400 tons/month		
Wastes (DTSC)	Fluorescent/HID lamps		
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Depressurized Tech**		
County	**Santa Clara**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)	2400		Has a Fleet to transport HW
Historic Tanner Category(ies)	Other recycling		Accepting new waste streams
Wastes Rec'd 02 (tons)			Considered expanding
Wastes Rec'd 01 (tons)	0		Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)			
Treatment Capacity (DTSC)	50,000 gals/mo		
Wastes (DTSC)	aerosol cans		
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Ionization Research**		
County	**Santa Clara**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)	240		Has a Fleet to transport HW
Historic Tanner Category(ies)	Aqueous Organics		Accepting new waste streams
Wastes Rec'd 02 (tons)	27		Considered expanding
Wastes Rec'd 01 (tons)	0		Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)			
Treatment Capacity (DTSC)	5000 gals/mo		
Wastes (DTSC)	Aqueous Solutions with Aldehydes		
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Safe Way Chemicals**		
County	**Santa Clara**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)	1651		Has a Fleet to transport HW
Historic Tanner Category(ies)	Stabilization		Accepting new waste streams
Wastes Rec'd 02 (tons)			Considered expanding
Wastes Rec'd 01 (tons)	6		Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)			
Treatment Capacity (DTSC)	1200 gphour		
Wastes (DTSC)	Degreasing solutions		
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Phibrotech**		
County	**Alameda**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)		15000	Has a Fleet to transport HW
Historic Tanner Category(ies)		Aqueous Metals	Accepting new waste streams
Wastes Rec'd 02 (tons)			Considered expanding
Wastes Rec'd 01 (tons)		1404	Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)		998	
Treatment Capacity (DTSC)		15000 gpd	
Wastes (DTSC)		Spent Copper Etching Solution	Currently being decontaminated
Treatment Tech. (facility)			Other
Treatment Throughput (facility)			
Tanner Treatment Category			Other
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Photo Waste Recycling**		
County	**Marin**		On DTSC list
Proposed Treatment Group	Other Recycling		Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)	2430		Has a Fleet to transport HW
Historic Tanner Category(ies)	Other recycling		Accepting new waste streams
Wastes Rec'd 02 (tons)	826		Considered expanding
Wastes Rec'd 01 (tons)	689		Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)	44		
Treatment Capacity (DTSC)			
Wastes (DTSC)			
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Merry X Ray**		
County	**San Mateo**		On DTSC list
Proposed Treatment Group	Other Recycling		Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)	101		Has a Fleet to transport HW
Historic Tanner Category(ies)	Aqueous Metals		Accepting new waste streams
Wastes Rec'd 02 (tons)	87		Considered expanding
Wastes Rec'd 01 (tons)	100		Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)	149		
Treatment Capacity (DTSC)			
Wastes (DTSC)			
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Dennis X Ray**		
County	**San Mateo**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)	88		Has a Fleet to transport HW
Historic Tanner Category(ies)	Aqueous Metals		Accepting new waste streams
Wastes Rec'd 02 (tons)	0		Considered expanding
Wastes Rec'd 01 (tons)	0		Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)	195		
Treatment Capacity (DTSC)			
Wastes (DTSC)			
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location			
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Diagnostic Imaging**		
County	**Alameda**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)			Has a Fleet to transport HW
Historic Tanner Category(ies)			Accepting new waste streams
Wastes Rec'd 02 (tons)		264	Considered expanding
Wastes Rec'd 01 (tons)			Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)			
Treatment Capacity (DTSC)			
Wastes (DTSC)			
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location	0		
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

Facility	**Philips Medical System**		
County	**Alameda**		On DTSC list
Proposed Treatment Group			Received Wastes in 2003
Proposed Capacity			Operating At Capacity
Historic Tanner Capacity (Tons)			Has a Fleet to transport HW
Historic Tanner Category(ies)			Accepting new waste streams
Wastes Rec'd 02 (tons)		123	Considered expanding
Wastes Rec'd 01 (tons)			Problems expanding
Wastes Rec'd 00 (tons)			
Wastes Rec'd 99 (tons)			
Treatment Capacity (DTSC)			
Wastes (DTSC)			
Treatment Tech. (facility)		Other	
Treatment Throughput (facility)			
Tanner Treatment Category		Other	
In business at current location	0		
Home office			
Customer Location			
Business Type of Customers			
Most restrictive permit			
% waste processed on site			
Residuals generated			
Amount of residuals			
What happens to recycled materials?			
Nearest Competition			
Reason for Expanding			

APPENDIX C
COMMON HAZARDOUS WASTE TREATMENT TECHNOLOGIES

1. Physical Treatment

Physical methods change the physical state of the waste. Common methods include: sedimentation, filtration, centrifugation, floatation, membrane separation, evaporation, distillation, extraction and absorption. Filtration and separation are often used to remove toxics from wastewater.

2. Chemical Treatment

Chemical methods change the chemical state of the waste. Common methods include:

- Precipitation. In chemical precipitation, a soluble substance is converted to an insoluble form either by a chemical reaction, solvent temperature change, solvent pressure change, or by changes in the composition of the solvent to diminish the solubility of the substance in it. Chemical precipitation is widely used to remove toxic metals.(i.e. arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, thallium, and zinc) from aqueous wastes. Spent pickle liquor from steel-finishing, metal plating solutions, and wastes from electronics manufacturing, are frequently treated in such a manner. Toxics may also be removed from contaminated groundwater by precipitation

- Solidification and Stabilization. Solidification and stabilization (S/S) refer to a set of technologies and/or processes that use binders and additives to treat hazardous wastes. These processes reduce the mobility and toxicity of contaminates in the waste, improve the handling characteristics of liquid-containing wastes, and/or prepare the waste for disposal into landfills. Solidification converts the waste to a solid form and/or encapsulates the waste constituents. It does not necessarily include a chemical reaction. Solidification may produce a monolithic waste form, a granular material, or a claylike material. In a stabilizing process, contaminants are converted to their least soluble, mobile, or toxic form, thereby reducing the hazard potential of the treated waste. S/S processes are effective in treating a variety of waste materials difficult to manage, including some radio-nuclides. Depending on the waste and applicable regulations, the treated product may have an industrial use. S/S processes have been used in conjunction with other treatment technologies, as part of a treatment train, or for treating an industrial waste stream, i.e. an organic waste containing heavy metals might be treated incinerated; then the noncombustible residues may be solidified.

- Oxidation and Reduction. Oxidation-reduction (redox) reactions are those reactions in which the oxidation states of component atoms change as a result of the transfer of electrons from one chemical species to another. A

chemical species is oxidized if its oxidation number increases (i.e., it loses electrons). If the oxidation state of a chemical species decreases (i.e., it gains electrons), it is reduced. Oxidation is widely used to remove organic contaminants (including phenols, pesticides, chlorinated solvents, polycyclic aromatic hydrocarbons, benzene, and toluene) as well as inorganic contaminants (including sulfides, ammonia, cyanide, and heavy metals) from dilute aqueous solutions , such as wastewater. Reduction is often used in conjunction with precipitation to remove heavy metals from solutions.

- Pervaporation. Pervaporation is a process in which a liquid stream containing two or more components is placed in contact with one side of a nonporous polymeric membrane, while a vacuum or gas purge is applied to the other side. The components in the liquid stream sorb into the membrane, permeate through the membrane, and evaporate into the vapor phase. The vapor is then condensed. Over the past decade, pervaporation as an alternative to air stripping to remove small concentrations of volatile organic compounds (VOCs) from large amounts of water, for instance in the treatment of contaminated groundwater.

- Evaporation. Evaporation is used in the treatment of hazardous wastes to transform a liquid into a slurry. Evaporation differs from distillation in that no attempt is made to fractionate the vapor. The most favorable areas in the United States for solar evaporation are in the southwest.

3. Thermal Treatment

Thermal processes, commonly called incineration, use heat to cause a chemical reaction that destroys or transforms a hazardous material. The increased temperature may be used in combination with other reactions, such as oxidation.

- Rotary Kilns. The rotary kiln was first patented in 1885. Rotary kilns can handle a wide variety of hazardous and non-hazardous feedstocks. It is particularly useful for wastes with a high solid content. The nonvolatile materials fed into the kiln (metals, stones, sand, and other inorganics) emerge from the kiln as ash. The gas stream that emerges from the kiln is then incinerated to oxidize the organics.

- Bubbling Fluid-Bed Combustors (BBC). Fluid bed processing has been widely applied since the 1940's to crack heavier petroleum fractions into gasoline and to gassify coal. Although it cannot be used with as wide a range of feedstocks as the rotary kiln, it can be used to process hazardous waste solids, slurries, and liquids. The bubbling fluid bed combustor achieves higher temperatures than the rotary kiln.

- Circulating Bed Combustors (CBC). The circulating bed combustor operates at fluid velocities above the BBC and therefore operates at

higher temperatures. CBC has been used to destroy a wide range of hazardous wastes, although the range of size and shape of solid feed is more restricted than for either the rotary kiln or the BBC. CBC can process solids, sludges, slurries, and liquid wastes. It can effectively destroy dioxins and PCBs.

- Cement Kilns. Hazardous wastes may be used as a feedstock for cement kilns. As with the rotary kiln, some hazardous wastes are stabilized in the cement, other are oxidized. While this technology was supported by many regulatory agencies in the late 1970's and early 1980's, in the 1990s, EPA began to consider the air impacts of cement kilns. New emissions rules were put into effect in 2002.

- Liquid-Injection Incinerators. These units may be on site treatment of hazardous wastes (at the location of the generator) or off site (at a sister facility or at a commercial disposal operation). In 1992, 64 percent of the incinerators in the US were liquid-injection incinerators. They process a wide variety of liquid wastes, including hazardous wastes.

4. Biological Treatment

Biological treatment involves the use of living organisms to destroy hazardous materials. Biological agents are widely used to treat industrial wastewater, contaminated groundwater, sludges, and soils, primarily those laden with organic pollutants. Biological treatments may be aerobic or anaerobic, depending on the characteristics of the waste and the level of treatment needed. While there are no definitive guidelines for process selection, aerobic processes generally are more appropriate for treating wastes containing lower chemical oxygen demand concentrations (COD) or biochemical oxygen demand (BOD) concentrations. Anaerobic processes generally are more suitable for treating higher-strength wastes. In an increasing number of cases, anaerobic processes are used for pretreating high-strength wastes to a level suitable for further treatment by aerobic processes.

5. Disposal or Isolation

Even after application of all available waste-reduction and treatment technologies, there is still a need for long-term disposal or storage of the residual solids including ashes, sludges, salts, contaminated soils, municipal wastes, and solidified liquids. Three common methods for treating residuals include:

- Landfills. A hazardous waste landfill contains and isolates hazardous wastes to eliminate or minimize exposures of the waste constituents to the environment and people. EPA has developed regulations regarding the physical characteristics of wastes suitable for landfilling. These regulations (40 CFR 264.300 and 40 CFR 265.300) include prohibitions on many hazardous wastes. Hazardous wastes delivered to a landfill site are placed in a manner such that only compatible wastes are disposed of

together. Wastes are placed either in separate areas or in individual cells within the larger landfill.

- Above Ground Disposal. To prevent the hazardous wastes, and their leachates, from contaminating groundwater, two aboveground options are often used to (1) vault storage and (2) aboveground landfills.

- Subsurface Injection of Liquid Hazardous Wastes/Deepwell injection. In 1995 there were 485 Class I Hazardous Waste Injection Wells in the US, the vast majority of which are located along the Gulf Coast and near the Great Lakes. Historically, underground injection wells have been used by the oil, gas, and chemical industries. According to an 1983 EPA report, manufacturers of organic chemicals account for about 44 percent of the wells and about 50 percent of the volume. In 1983, only 4.4 percent of the total injected volume was handled by commercial waste disposers (18 wells at 13 facilities). The commercial wastes were primarily acids, and organic chemicals.