State of Nevada

DRAFT Solid Waste Management Plan

July 2004

Kenny C. Guinn, Governor

Nevada Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89710

EXECUTIVE SUMMARY

This *DRAFT* update to Nevada's *Solid Waste Management Plan* provides a description of the existing framework for solid waste management within the State, consisting of solid waste laws, regulations and infrastructure. The *Plan* describes governmental roles and responsibilities, statewide solid waste management trends, and municipal solid waste systems throughout the State. Finally, solid waste issues of concern are defined, and strategies are proposed to address them.

State and local government each have a role in solid waste regulation and management. Governmental authorities and obligations are defined in the Nevada Revised Statutes (NRS) and the Nevada Administrative Code (NAC). In Nevada, authority to regulate solid waste is assigned by statute to the Clark and Washoe County health districts in their jurisdictions, and to the Nevada Division of Environmental Protection (NDEP) within the Department of Conservation and Natural Resources in all other areas of the State. This regulatory authority primarily administers public health and environmental protection standards for the collection and disposal of solid waste. NDEP also has responsibility for statewide planning and public information and education. It is the municipal governments, however, that are given the responsibility to plan and implement a municipal solid waste management system that provides for the management of all solid waste generated within the municipality.

Nevada solid waste trends are discussed under the headings of landfills, collection, waste generation and recycling rates, and solid waste importation. Good solid waste planning relies heavily on meaningful and reliable data, so the *Plan* addresses data collection and quality.

Section 3 of the *Plan* is an assessment of each county's solid waste management system. Each assessment (provided in Appendix 3) is composed of a county map showing solid waste facilities and a companion atlas that describes the county's solid waste infrastructure and services. The assessments can be used as benchmarks for tracking solid waste system changes in each county, or for comparing one county's system with another's.

Section 4 discusses solid waste issues of concern and proposes strategies to address them. The issues are grouped under the headings of landfills, recycling, waste importation, special waste

management, rural solid waste management needs, open burning/illegal dumping and state/local funding.

Technical issues are raised under the landfill heading. Strategies proposed respond to the concerns that:

- New large landfills or expansions present new or increased risks to Nevada's groundwater if constructed without engineered composite liners;
- Bioreactor landfill technology is in the research and development phase and may not be appropriate in Nevada's desert climate;
- 30 years of postclosure care may not be long enough; and
- The conventional final cover design using a clay layer may be ineffective over the long term.

The 1993 recycling law (AB 320) established a 25% recycling rate goal. Since Nevada began tracking the rate it has fluctuated between 10 and 16 percent. Although Washoe County and Carson City rates have approached the 25% goal, Clark County's rate has remained low, bringing the State rate down with it. Barriers to recycling in Clark County are discussed and some strategies put forward to improve recycling opportunities and promotion there. It is also noted that the municipal recycling program requirements have not been enforced. Municipalities should fully implement existing program requirements before an overhaul of recycling statutes is sought.

Solid waste importation is an issue for Nevada because of low gate fees and the lack of a State disposal fee or permit fee. Commercial landfill developers will be attracted to Nevada if they perceive a potential to site landfills without engineered composite liners. Due to Nevada's reliance on the tire fee for solid waste regulation, out-of-state waste is seen as getting a free ride. While Nevada cannot discriminate against out-of-state waste, it can establish permit fees and liner requirements to mitigate environmental risks and offset the cost of regulatory oversight for large new disposal sites.

Special wastes are those that require special handling due to their physical, chemical or biological characteristics. Electronic wastes are currently getting attention around the country because the wastestream is rapidly growing and some components, i.e. TV screens, computer monitors, cell phones, have been identified in some states as hazardous wastes. As industry and government

partnerships seek to alleviate the problem on a national level, public information is needed in Nevada concerning proper recycling and disposal options.

In rural Nevada, several municipalities struggle to provide the basic elements of a solid waste management system. Poor service in some areas has led to problems of illegal dumping, open burning and chronic violations at county-operated facilities. Suggestions for improving rural solid waste management include a State-sponsored landfill operator training and certification program, public education aimed at reducing open burning of refuse, and a State grants program to supplement local government planning and facility operations efforts.

The *Plan* evaluates the adequacy of current tire fee revenue to fund the three solid waste management authorities. The NDEP portion is insufficient to carry out its responsibilities of statewide planning, public information/education, solid waste management regulation in 15 counties and to set aside funds for recycling and rural solid waste assistance grants. A statute revision is proposed to seek authority to collect permit fees to defray the costs of permit application reviews and facility inspections. Other revenue enhancement options are considered, including a fee on waste disposal.

Some rural local governments need State assistance with solid waste management. Although tax authority is available to them, the tax base is not. In such locations private solid waste companies do not see a potential for profit in the operation of a solid waste collection & disposal system, leaving the municipality to face the challenge of meeting community solid waste needs in a manner that complies with all applicable environmental regulations.

This *Plan* is intended to be a resource and guide for local governments as they develop their solid waste management plans. It is intended for waste management service providers, including landfill operators, refuse collectors and recyclers, as well as solid waste generators, including all of Nevada's industries, businesses, governmental agencies and residents. Finally, it is intended to provide information and guidance for protection of public health and the environment, the conservation of natural resources and the beautification of Nevada's landscape.

Table of contents

LIST OF FIGURES

LIST OF APPENDICES

MAPS

1. Introduction

1.1 Scope and Purpose

Management of solid waste is a vital part of the infrastructure of any city or county. Local reuse and recycling programs help conserve resources and instill a conservation ethic in citizens. Cost-effective and efficient waste collection systems prevent illegal dumping and protect public health. And properly designed, well-operated landfill sites ensure safe disposal of solid waste.

Planning and implementing a system to effectively manage solid waste is a responsibility of local government. State government primarily serves a regulatory role with respect to solid waste management, implementing the regulations adopted by the State Environmental Commission. Appendix 1 contains a list of Nevada Revised Statutes (NRS) and Nevada Administrative Codes (NAC) pertaining to solid waste management. Planning, coordination and public education are also responsibilities of the State. NRS 444.570 requires the State Environmental Commission to develop a statewide plan for management of solid waste and to update the plan every 5 years. This planning requirement is aimed at assessing solid waste management systems statewide and provides an opportunity to review the efficacy of existing laws and regulations.

The most recent State Solid Waste Management Plan was adopted in 1992. At that time the plan focused on implementation of more stringent Federal landfill regulations, recently adopted State recycling requirements and concerns over importation of out-of-state waste. Much has changed over the past twelve years. Nevada's infrastructure for solid waste collection and disposal has improved dramatically, especially in rural areas of the State. Curbside recycling services are widely available in urban areas, and a vibrant composting industry has emerged in northern Nevada. At the same time, importation of waste from California has increased tenfold and is roughly equal to the amount of waste Nevadans divert through recycling.

Ensuring safe handling of solid waste continues to be a central part of the Nevada Division of Environmental Protection's (NDEP) mission. Toward that end, this plan reviews the status of collection and disposal systems within each County. It also considers the adequacy of landfill standards in light of recent trends towards importation of solid waste to rural disposal facilities.

Finally, the plan attempts to identify viable economic incentives and other methods that will encourage more efficient use of resources, reduction of waste generation and optimum recovery of resources from the solid waste stream.

1.2 Governmental Roles and Responsibilities

1.2.1 Municipal Governments

Each municipality or health district in Nevada is required by NRS 444.510 to develop and carry out a plan for a *"solid waste management system"*, which is defined in statute as *"the entire process of storage, collection, transportation, processing, recycling and disposal of solid waste. The term includes plans and programs for the reduction of waste and public education."* Municipalities are also required to implement recycling requirements in NRS 444A.040. In order to carry out these responsibilities, the statutes empower municipalities with authority to adopt ordinances, acquire land, offer franchises for solid waste collection, and levy appropriate fees—these fees are not subject to the fee revenue cap specified in NRS 354.5989.

Local governments are also largely responsible for enforcing statutory prohibitions against unlawful dumping. Amendments to the solid waste statutes adopted by the Legislature in 2001 provide significant authority to local government agencies and peace officers to seek civil and criminal penalties and to force those caught dumping to clean up illegal dumpsites and perform community service.

1.2.2 Health Districts

In Clark and Washoe Counties, the district health departments are the primary regulatory agencies over solid waste management. The statutes designate these agencies as the *"Solid Waste Management Authorities"* within their respective jurisdictions. In addition to enforcing unlawful dumping provisions, the health districts are responsible for issuing permits and conducting compliance inspections at disposal sites, transfer stations, materials recovery facilities, and other facilities that handle or process solid waste within their jurisdiction. Health District Boards may adopt solid waste regulations as long as they do not conflict with the State regulations adopted by the State Environmental Commission. Health Districts must adopt regulations governing municipal solid waste landfills and certain categories of hazardous waste landfills that are at least as stringent as federal standards in 40 CFR Parts 257 and 258. The Washoe County District Health Department,

through an interlocal agreement, also exercises regulatory authority over the Lockwood Regional Landfill, which is located in Storey County.

As noted above, either the municipal governments or the health districts must prepare and implement a local solid waste management plan. In Clark and Washoe Counties the health districts have accepted this responsibility. There are some advantages to this arrangement because the health districts are regulatory entities comprising all the municipalities (cities and unincorporated areas) within county borders. There are also disadvantages, however. Most local planning efforts originate within municipal governments that have authority to levy taxes and assessments, enter contracts for public services and award franchises. Such authority is essential to planning and implementing a solid waste management system. The health districts' freedom to develop and implement solid waste plans is limited by their inability to carry out these central functions of solid waste management.

1.2.3 State Government

The Division of Environmental Protection has responsibility for statewide planning, enforcement of recycling requirements and implementation of a public information and education program. In addition, the Division is designated as the solid waste management authority in areas of the state outside of the jurisdiction of the Clark and Washoe County health districts. The Division is also tasked with periodically reviewing the programs of other Solid Waste Management Authorities, principally to ensure that their permitting and compliance monitoring programs are consistent with Federal municipal landfill criteria.

Nevada has been approved by US EPA to enforce federal municipal landfill regulations in lieu of US EPA. In order to receive approval, the State had to demonstrate that its regulations were at least as stringent as the Federal landfill criteria and that it had adequate resources and authority to enforce the standards. The Division and health districts have an ongoing responsibility to ensure compliance with the minimum federal standards for municipal landfills. Procedures are established in statute for the NDEP to exercise authority within Clark and Washoe Counties if necessary to enforce solid waste laws and regulations. However, US EPA retains authority to take enforcement action if the agency finds evidence that handling or disposal of solid waste is presenting an imminent and substantial endangerment to public health or the environment or where there are

violations of the federal landfill criteria and the State has failed to take action to remedy the situation.

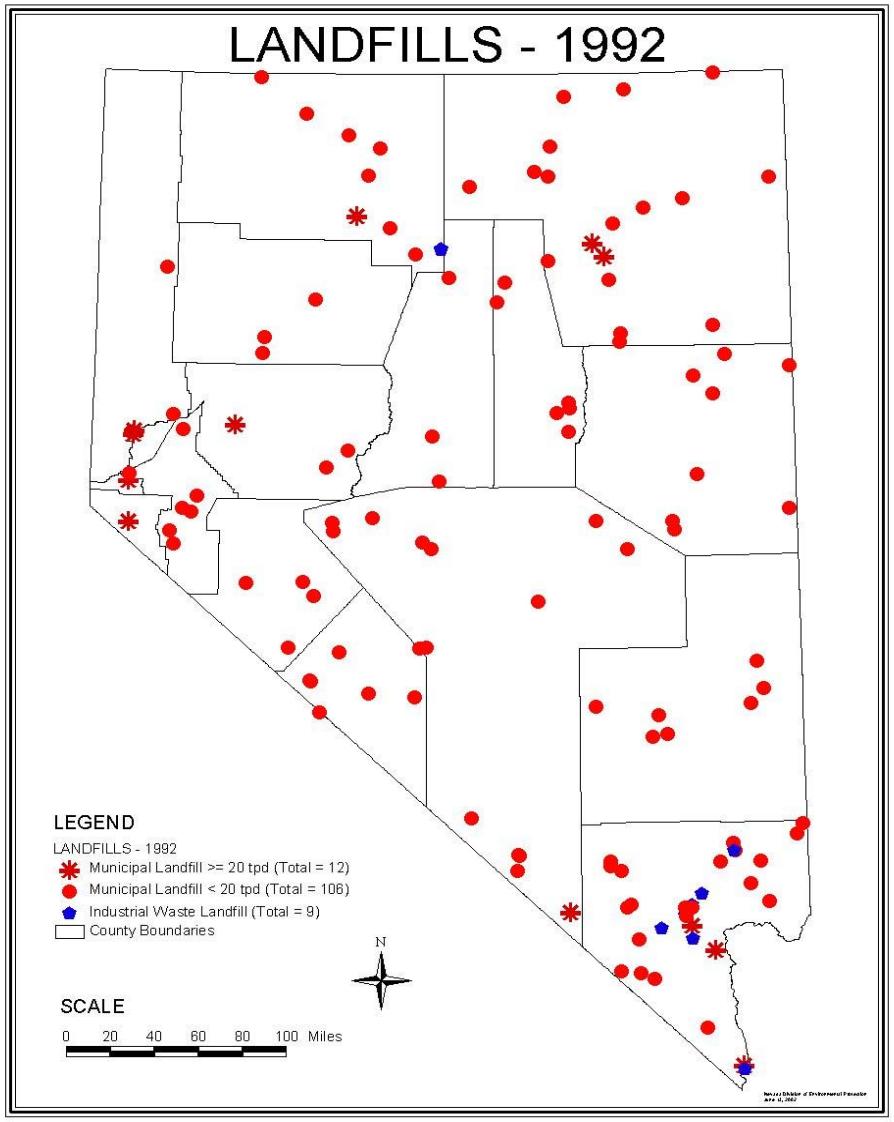
1.2.4 Tribal Governments

Neither the NDEP nor the health districts has authority to regulate solid waste management on tribal lands. In Nevada, US EPA, Region IX administers municipal landfill and other federal solid waste regulations on tribal lands. The Nevada Rural Water Association, under a contract with the US Dept. of Agriculture, provides technical assistance to tribes on solid waste issues. There has historically been only informal coordination between tribes and the NDEP on solid waste issues, yet solid waste management issues clearly cross jurisdictional boundaries. Open burning, collection and recycling services, and protection of groundwater from landfill contaminants are examples. NRS 444A.040 requires municipalities with approved recycling programs to make them available to reservations and colonies within their jurisdictions. In 2003 the NDEP established a tribal liaison position within the agency. The NDEP Bureau of waste management will utilize this new position to improve coordination on solid waste issues among tribal, municipal and state solid waste planners.

2. Statewide Trends in Solid Waste Management

2.1 Landfills

Implementation of more stringent State and Federal landfill regulations in the 1990's drove regionalization of the solid waste collection and disposal infrastructure. Figure 1 illustrates the distribution of municipal landfills before and after implementation of more stringent standards. More than 100 small, rural, open dumps have been closed in favor of regional municipal landfills and a network of transfer stations and public waste bins. Map 1 illustrates the distribution of solid waste facilities in 2004.



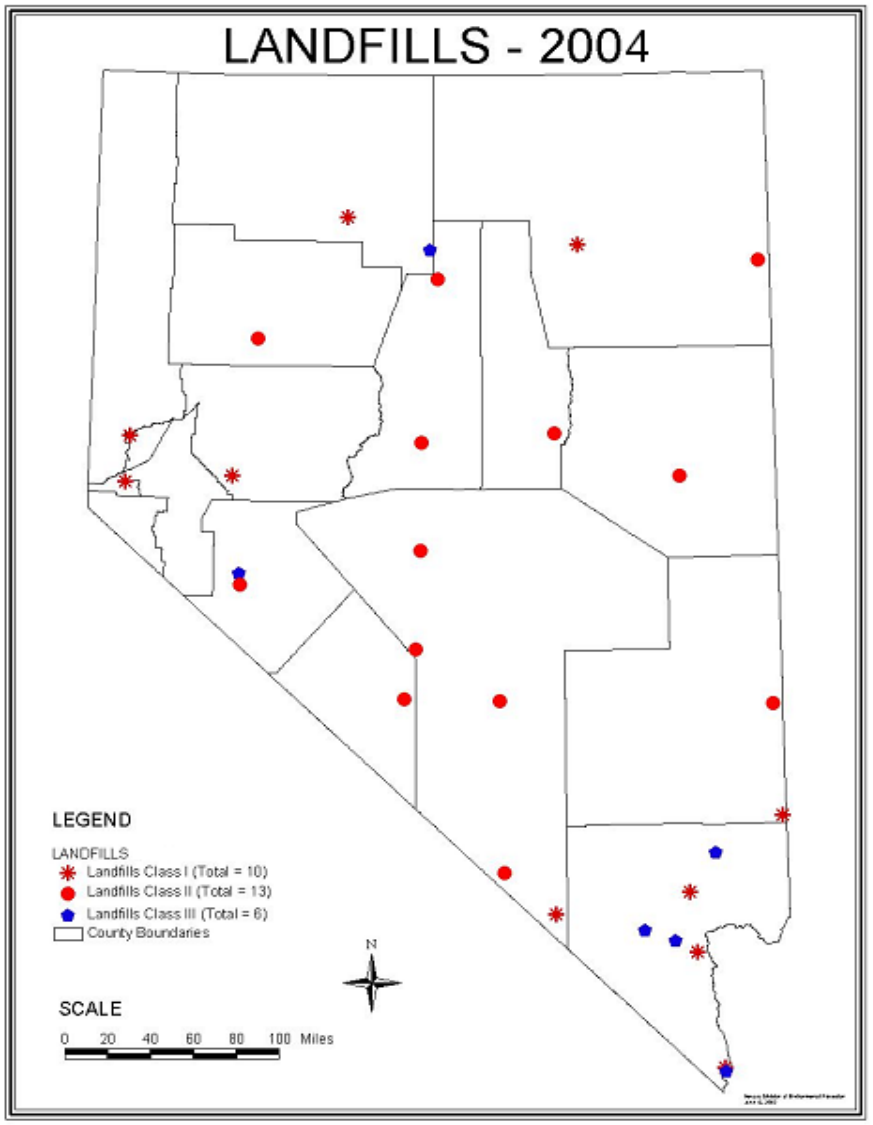


Figure 1. Active Nevada landfills in 1992 and 2004

The relative size of currently operating landfills generally corresponds with the distribution of the State's population (Figure 2). Just two landfills receive roughly 90% of the waste disposed of in Nevada, the Apex landfill serving the Las Vegas Valley and the Lockwood Landfill, which primarily serves the Reno-Sparks area. Both of these landfills are privately owned and operated.

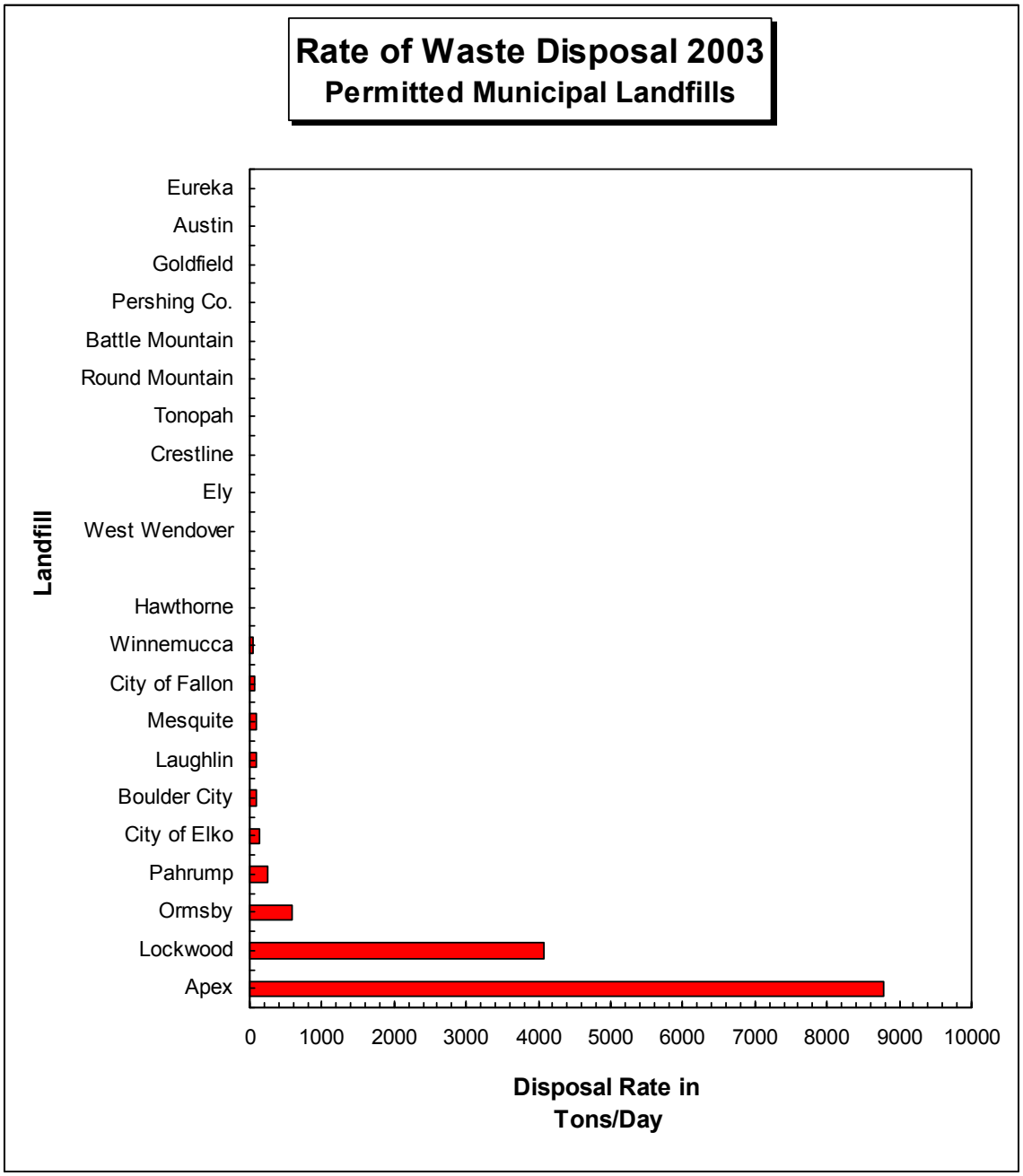


Figure 2. Daily disposal rate at permitted municipal landfills (averaged over 365 days).

Nevada's landfills range from very large to extremely small. Nevada's largest landfill, the Apex Landfill, receives over 8,000 tons of solid waste per day on average and is one of the largest municipal landfills in the nation, based on annual tonnage of solid waste received for disposal. Nevada's smallest landfills are indeed very small. The Goldfield landfill, which serves a population of less than 1,500 people in Esmeralda County, receives about 3 tons of solid waste per day on average.

In general, Nevada municipalities have assured landfill capacity for decades into the future. Appendix 3 provides a summary of municipal waste landfill capacities and their projected active lives.

2.2 Collection

Solid waste collection has changed in two important respects during the last twelve years. First, bi-weekly collection of recyclables at single-family homes became available in Clark and Washoe Counties and Carson City pursuant to municipal recycling program requirements adopted in 1991. The second change is the network of transfer stations and rural public waste storage bins from which waste is hauled at least weekly to regional landfills. Public waste bin facilities in Clark, Washoe and Storey counties have an attendant and charge disposal fees. Most of the other sites are unattended and are maintained at county expense, either directly or through a county contractor. Transfer station and public waste bin facility locations are listed below and shown on Map 1.

Transfer Stations

Clark:	Cheyenne (North Las Vegas), Henderson, Sloan
Churchill:	Fallon
Douglas:	Gardnerville
Elko:	Jackpot
Lyon:	Fernley, Smith Valley, Sutro (Dayton), Yerington
Washoe:	Incline Village, Reno, Stead

Public Waste Bins

Clark:	Searchlight, Sandy Valley, Mt. Charleston, Moapa Valley
Elko:	Tuscarora, Wells, Midas, Jarbidge, Montello, Carlin, Pilot Valley
Esmeralda:	Fish Lake Valley, Silver Peak
Eureka:	Crescent Valley
Humboldt:	Kings River, Orovada, Paradise Valley, Denio
Lander:	Kingston
Lincoln:	Rachel, Alamo, Hiko, Panaca, Pioche, Dry Valley, Caliente, Ursine
Mineral:	Mina-Luning

Nye:	Beatty, Amargosa Valley, Belmont, Manhattan
Pershing:	Grass Valley, Unionville, Imlay
Storey:	Virginia City
Washoe:	Gerlach, Empire

Nearly all of the municipal waste in the urban areas of Reno and Las Vegas is collected, respectively, by Waste Management, Inc. and Republic Services of Southern Nevada subject to franchises awarded by the municipalities. About 15 smaller companies provide pickup to businesses and residences throughout most of the rest of the state. The municipal governments of Fallon, Gardnerville, Minden, and Caliente operate their own garbage collection services. Residential collection service costs are between $11 and $12 per month in Clark, Washoe and Carson City. In rural counties the range is wider, between $5 and $19 per month. In sparsely settle areas of the state, such as Lincoln and Esmeralda Counties, residents must haul their own waste to the nearest landfill or public waste bin.

2.3 Waste Generation and Recycling

As depicted in Figure 3, the amount of total solid waste generated in Nevada has steadily increased, significantly exceeding the State's population growth rate in the 1990s. There is an apparent increase in industrial waste generation in 1999 because the Wells Cargo construction and demolition debris landfill first began reporting in that year. The decline in 2002 is believed to reflect the economic downturn. The amount of material diverted for recycling has remained flat statewide, with the recycling rate ranging between 10 and 15%, however, there has been significant local variation in recycling rates. While Washoe County and Carson City have steadily improved their recycling rates and have either met or exceeded the statewide diversion goal of 25%, Clark County's rate fluctuated between 8 and 13%.

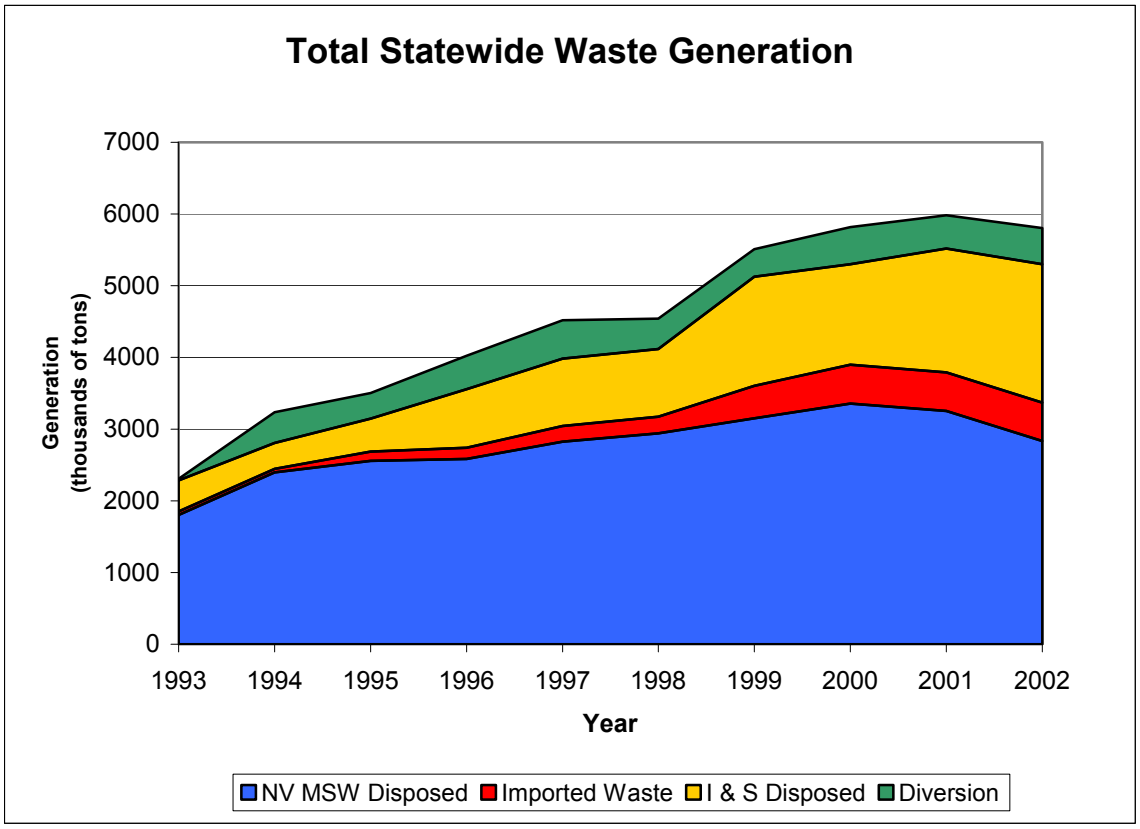


Figure 3. Total waste generated in Nevada. Compiling of diversion/recycling began in 1994. Diversion data for 2003 is unavailable.

2.4 Importation

The amount of solid waste imported from out of state has increased substantially over the past decade. The Lockwood Regional Landfill, located east of Reno-Sparks in Storey County, has received virtually all of this imported waste. Lockwood, which is owned and operated by Waste Management Inc., provides disposal capacity for much of western Nevada, including Washoe, Storey, Lyon, Douglas and part of Churchill County. In addition, Lockwood receives waste from several areas in California, including the Lake Tahoe Basin, the Sierra foothills and the City of Sacramento. The amount of waste imported into Nevada for disposal at Lockwood has increased nearly 10-fold in the past decade, and presently accounts for about 14% of the municipal solid waste disposed of in Nevada and less than 2% of the waste generated in California. Ironically, the amount of waste currently imported closely approximates the amount of waste Nevadans divert for recycling (Figure 4).

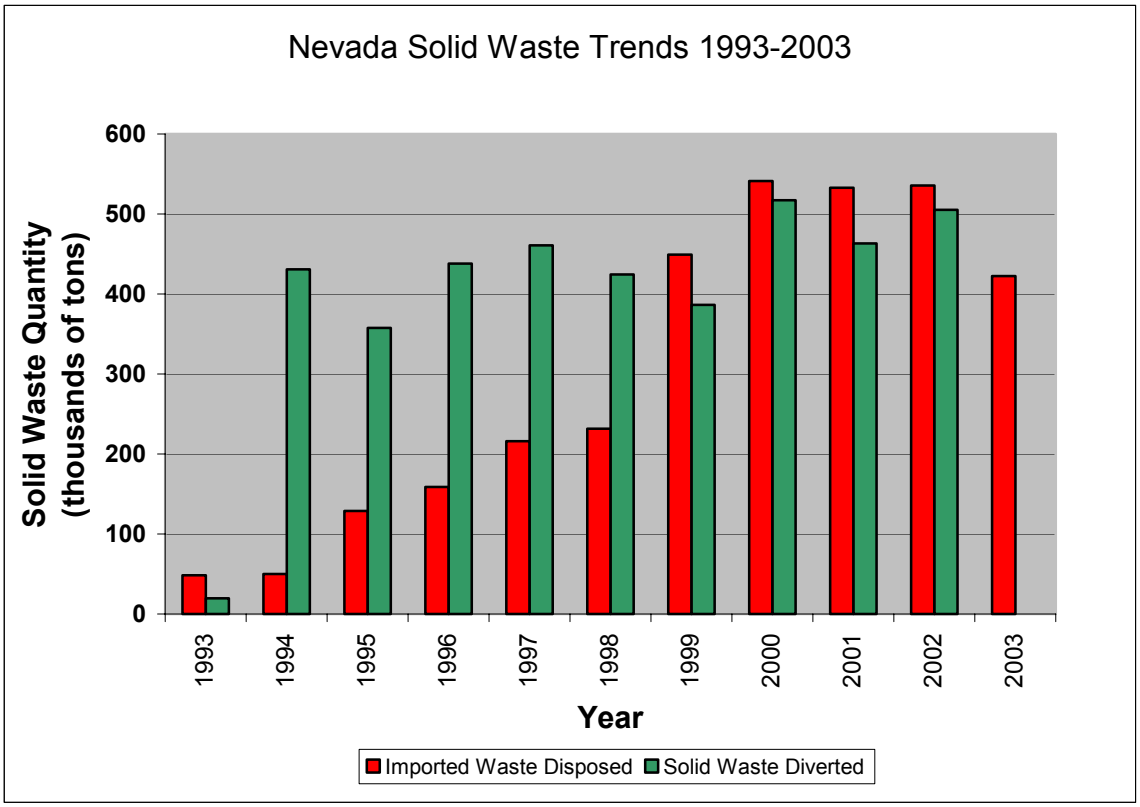


Figure 4. Nevada solid waste trends for 1993 to 2003. 1993 reported diversion for the six month period 1/1/93-6/30/93. 1994 reported diversion for the period 7/1/93-6/30/94. 1995 reported diversion for the period 7/1/94-6/30/95. Diversion data for 2003 is unavailable.

There is potential for a significant increase in importation of solid waste into Nevada. Although the Apex Landfill is not currently receiving any imported waste, it is privately owned by Republic Services and positioned on a rail line making future importation conceivable. Apex's estimated life under the current permit is in excess of 40 years, and Republic owns additional acreage at the site that would allow further expansion. The Crestline Landfill, located in Lincoln County near Panaca, is also privately owned and positioned to receive rail-hauled waste. Crestline is currently serving the very modest disposal needs of Lincoln County, yet the site has obtained a permit to receive up to 4,000 tons of solid waste per day once lined disposal cells are constructed and financial assurance for closure is demonstrated. The investors that own Crestline are attempting to sell the site and have obtained their permit apparently speculating that the site and permit can be sold to a viable landfill operator with contracts for disposal of out of area waste.

Private developers have recently proposed to convert a closed mining pit in central Nevada for solid waste disposal, a proposal that has been welcomed by the local community as a potential source of much-needed local government revenue. For the same reason, several local governments have shown interest in developing their own commercial waste disposal facilities: the City of Fallon recently increased its permitted disposal rate at the Russell Pass Landfill, while both the City of Elko and Humboldt County are seeking to expand landfill capacity beyond the needs of the local communities. These efforts to gain new landfill capacity present the potential for significant importation of out-of-state waste. Whether the potential for large-scale importation is realized depends on the regional market for solid waste disposal, the availability of disposal capacity in the region and the feasibility of individual projects.

2.5 Data Collection and Reporting

Reliable data on the quantities of solid waste disposed and recycled are necessary in order to conduct state and municipal waste management planning, assure future disposal capacity and provide citizens with a measure of the success of local efforts to recycle and reduce waste. It is also necessary to know the meanings of the terms used:

- *Municipal solid waste (MSW):* solid waste from residential, commercial and institutional waste generators
- *Industrial waste*: non-hazardous solid waste generated at industrial plants; also includes construction and demolition debris
- *Special waste*: solid waste that requires special handling due to its physical, biological or chemical nature, eg. infectious waste, asbestos waste
- *Recycling rate:*

$$\frac{\text{MSW recycled}}{\text{MSW disposed + MSW recycled}} \times 100\%$$

Waste imported from outside of the jurisdiction is not counted in the recycling rate.

The data referred to in the above sections are useful for discussing trends and making comparisons, although there are areas where information is lacking or questionable. Some general comments on the quality and interpretation of solid waste data are provided below.

2.5.1 Disposal Quantities and Per Capita Generation Rates

On a statewide basis Nevada's solid waste disposal data is good. Quarterly, semi-annual or annual disposal reports are required from all landfills. The larger landfills have scales, and over 95% of

Nevada's waste passes over these scales. The smaller landfills, however, use volume estimates and conversion factors to report tonnage disposed. In the rural counties, wide variations in per capita generation rates (Figure 5) highlight the inexact nature of volume estimates. While Lincoln County's generation rate is anomalously high, the low rates of Eureka, Lander and Pershing Counties are probably due to underestimating disposal volume. Storey County waste disposal has not been counted separately from Washoe's, and only the small portion disposed at the Ormsby Landfill shows on the graph. It is unclear why Churchill's rate is so low since all of this county's waste is disposed at either the Lockwood Landfill or City of Fallon Landfill, both of which have scales.

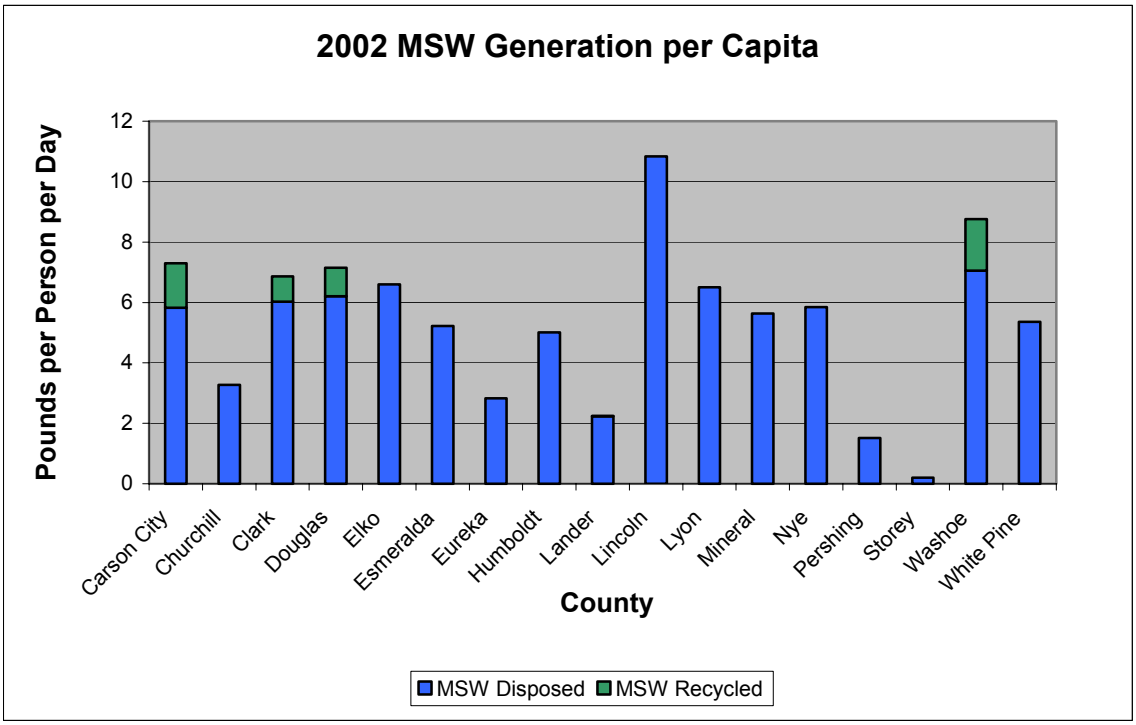


Figure 5. Municipal solid waste generated per capita for each county. Esmeralda, Eureka, Lander, Lincoln, Mineral, Nye, Pershing, and White Pine weight is calculated from volume estimates. Storey County represents only self-hauled waste to the Ormsby Landfill.

Figure 6 shows the greater consistency in the disposal data from landfills with scales. These data indicate an average MSW disposal rate of 6.4 pounds/person/day in the counties shown, a rate that probably represents a good estimate for the other counties also.

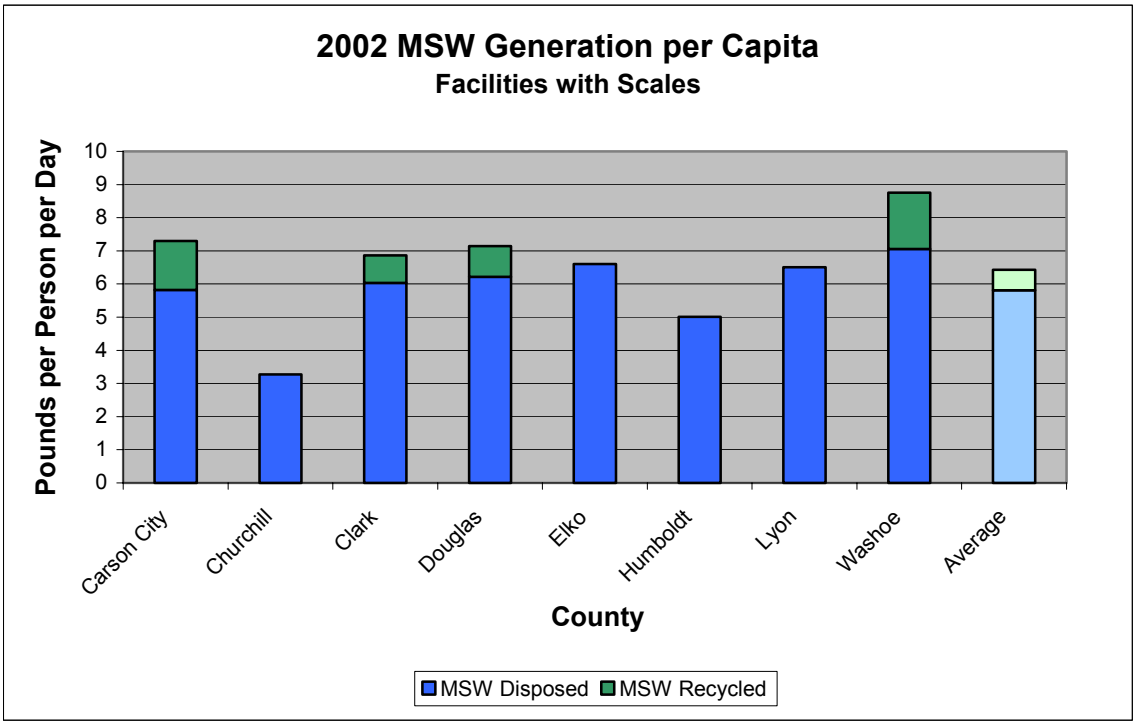


Figure 6. Municipal solid waste generated per capita for each county using disposal sites equipped with scales. (Average not weighted)

It has been suggested that Nevada's tourism economy has an effect on the municipal waste generation rate. The Las Vegas Convention and Visitor's Authority reports over 35,000,000 visitors per year to the area. These visitors are generators of municipal solid waste, but since they are not counted in the resident population, it is argued that per capita waste generation tends to be higher than in non-tourism economies. This hypothesis is not supported by the data presented in Figure 6, however, and a waste characterization study is needed in order to assess waste generation patterns in Nevada's tourist economy.

2.5.2 Recycling Quantities

In 1991 the state legislature set a goal of recycling 25% of the total solid waste generated in each municipality. In order to evaluate progress towards the recycling goal, the NDEP surveys county recycling rates each year. While the concept of recording and reporting the quantities of all the materials recycled may seem simple, it demands the effort and cooperation of

municipal governments, recycling centers and disposal services. In every county with a population greater than 40,000, recycling centers are required to submit a certified annual report of the material recycled to the municipal government. The municipality compiles this information in its annual recycling rate report to the Division, who, in turn, compiles a state recycling rate report. In practice, municipalities often do not receive complete and accurate reports in a timely manner, thus requiring follow-up with the recycling centers. Although regulations require the reports from recycling centers, there are no penalty provisions for failure to submit them. The municipality must also take care to avoid double-counting of materials, which happens, for example, if a recyclable material generator and the recycling center that receives it both report it as recycled. Finally, in reviewing the municipal reports, the Division checks the data to verify its accuracy. Any abnormal or inconsistent numbers are flagged, and the reporting county is contacted for additional information or clarification.

It is important that the state and the local governments provide reliable and meaningful measures of recycling rates. In order to build public confidence in the reports it is also important that the data collected be verifiable, and that the terms and methods used in calculating the rate be simple, consistent and available for public review.

3. Assessment of Municipal Solid Waste Management Systems

Appendix 3 contains a map and corresponding one-page atlas for each county in Nevada. Each map provides a snapshot for the year 2004 of the existing solid waste infrastructure. Each atlas provides information under the following headings:

- Local solid waste planning authority;
- Population and solid waste trends;
- Active municipal waste landfills;
- Solid waste and recyclables collection services;
- Recycling drop-off sites;
- Household hazardous waste collection services.

The solid waste trends presented are as follows:

- *Municipal solid waste (MSW) generated:* solid waste generated within the county from residential, commercial and institutional sources.
- *Industrial/special waste disposed:* solid waste generated from industrial sources that do not have on-site disposal facilities. The waste may come from either within or outside the county. Examples are construction/demolition debris, waste tires, sludges.
- *Imported waste disposed:* solid waste disposed that is generated outside the county.
- *Recycling rate:* Recycling rates are for MSW only and are given as historically reported. The recycling rate is calculated as the tons recycled divided by the tons generated.

4. Solid Waste Management Issues and Strategies

Disposal and recycling regulations have been adopted and implemented over the last 12 years that have significantly changed the way we manage solid waste in Nevada. In reviewing the current status of Nevada's solid waste management systems some old problems are seen to persist while some new issues have been identified. Do our solid waste management systems protect public health and the environment, enhance the beauty of the landscape and conserve natural resources? Have solid waste laws and regulations achieved the goals for which they were adopted? This section of the State *Solid Waste Management* Plan describes issues that deserve attention and suggests strategies for addressing them. The issues are grouped under the general headings of: landfills, recycling and waste prevention, waste importation, special waste management, rural solid waste management needs, open dumping/burning and state and local funding.

4.1 Landfills

Since the federal criteria were established in 1991, some landfill researchers and operators have pointed to weaknesses in the criteria and suggested potential alternatives to address them. In Nevada, proposals for large commercial facilities to be developed without engineered liners raise questions about the requirements for containment of landfill leachate and gas.

4.1.1 Liner Requirements

All municipal waste landfills in Nevada are required to conform to federal standards adopted under Subtitle D of the Resource Conservation and Recovery Act (RCRA). Because Nevada has an EPA-approved program, the Solid Waste Management Authorities may apply flexible performance standards and waive certain requirements if a landfill owner demonstrates that these requirements are not necessary for the protection of the environment. The Solid Waste Management Authorities have used this flexibility to approve landfills without engineered composite liners where natural clay barriers and the depth to the water table indicate that landfill leachate will not contaminate groundwater. The avoidance of the cost for a liner has enabled rural Nevada communities to have solid waste disposal capacity that they might otherwise not be able to afford, while maintaining reasonable assurance of environmental quality.

Recent interest by rural communities and private developers in the commercial potential for waste importation is an opportunity to reevaluate the practice of siting landfills without engineered liners. Additional waste volume may pose additional risk. If a rural community's 100 ton per day landfill is proposed to expand to accept 4,000 tons per day, Nevada should offset this risk by requiring the added safety factor of an engineered liner with leachate collection system.

4.1.2 Bioreactor Landfills

The standard approach to landfill design is the "dry tomb", the minimization of leachate generation by the exclusion of liquids from the buried waste. Some researchers have criticized the "dry tomb" design, contending that it delays decomposition of waste such that the waste will always present a threat to groundwater. An alternative technology, the "bioreactor" landfill has been advocated to address this concern, and is getting more attention among regulators and the waste industry. A bioreactor landfill employs leachate recirculation and the controlled addition of liquids to promote waste decomposition. Some bioreactor landfills are now being operated in other states, and in 2004 the USEPA revised the municipal landfill criteria to allow states to issue research, development and demonstration (RD&D) permits that

provide a variance form certain landfill criteria, principally the exclusion of liquids. Data gathered from the new bioreactor landfills will help regulators and landfill owners to better judge the viability of this design under different climatic conditions. It remains to be seen whether the bioreactor could be a safe and economical alternative design for Nevada, where the climatic and hydrogeologic setting appears to favor the indefinite containment of solid waste in a "dry tomb."

4.1.3 Postclosure Care Period

Landfill owners are required to provide postclosure care for a 30-year period following the site's final closure to: maintain the final cover, monitor for explosive gas and, if applicable, monitor groundwater and maintain and operate the leachate collection system. Some states have revised their criteria to require either "perpetual care" or extended care until the waste no longer poses a threat to groundwater. Although Nevada presently has only two landfills with leachate collection systems, failure to manage leachate at these facilities beyond the 30-year period could result in a liquid build-up on the liner that would drive leachate through liner leaks and downward through the unsaturated zone beneath the landfill. In addition to leachate management concerns at a few landfills, long-term integrity of the final cover is a valid concern for all Nevada landfills, because natural forces will eventually impair every final cover, thus compromising the integrity of the waste containment system.

4.1.4 Final Cover Design

The prescriptive standard for municipal waste landfill covers consists of an 18-inch thick layer of compacted clay topped by a 6-inch layer of soil capable of supporting vegetation. The clay layer is intended to impede infiltration of moisture into the waste mass. In the last few years researchers have asserted that the wetting-drying cycles resulting from direct exposure to the atmosphere cause cracks do develop in the clay. New data suggest that such covers are likely to fail within a few of these cycles.

While the literature contains several alternative final cover (AFC) design concepts, the evapo-transpirative cover (ET cover) is most promising for Nevada's arid climate. Such covers can be designed to exceed the infiltration reduction performance of conventional covers and have other advantages, including more readily available construction material, ease of construction

and increased long-term cover integrity. While Nevada regulations allow Solid Waste Management Authorities to approve AFC designs, very few permit applications have incorporated them to date. The absence of AFC design work in Nevada may be due to design engineers' lack of familiarity with AFCs, the lack of a standardized approach to demonstrations of effectiveness, and applicants' fears of delay in regulatory review of an innovative design.

4.1.5 Landfill Gas

Since federal municipal waste landfill criteria were adopted in 1991, the design and operation of these facilities for the proper management of landfill gas has become increasingly important. The federal standards were primarily intended to prevent explosion hazards due to the generation and migration of methane. At the same time, it was a commonly held opinion that arid landfills do not generate significant quantities of landfill gas, and that this issue is, therefore, of little importance in Nevada.

More recently, however, information has accumulated from research and operational data that landfill gas management is an issue that deserves attention for at least three reasons in addition to explosion hazard control:

- In 1996 *New Source Performance Standards* (NSPS) and *Emission Guidelines* (EG) were adopted under provisions of the federal Clean Air Act to reduce emissions of air pollutants resulting from waste decomposition at municipal landfills. Five Nevada landfills are subject to NSPS or EG requirements because they exceed the permitted capacity threshold established in the federal rules. In conjunction with these rules, EPA established the *Landfill Methane Outreach Program* to promote gas collection and energy recovery development. Landfill gas projects may help larger Nevada landfills to meet financial objectives while reducing air pollution, conserving energy and complying with air pollution standards.

- The assumption that arid landfills do not produce gas is contradicted by the experience of the Apex Landfill in Clark County, which has been collecting and flaring gas since shortly after it began accepting waste in 1993. While it has been suggested that this apparent anomaly is due to higher moisture content in Clark County's municipal waste, Apex is also unique in being Nevada's only large landfill with an engineered liner.

- Landfill gas migration is now generally recognized as a potential source of groundwater contamination. Remediation investigations at arid landfills in Arizona, California and elsewhere suggest that the migration of volatile organic compounds (VOC) in the gas

phase is a more likely mechanism of groundwater contamination at such sites than leachate migration.[1]

Strategy

1. Consider revision of solid waste statutes and regulations to establish a landfill size threshold above which an engineered liner will be required.

2. Do not seek adoption of authority to issue RD&D permits for bioreactor landfills unless a good case is made for their safe operation in Nevada.

3. Consider regulatory changes to the postclosure care standards to ensure the integrity of waste containment systems as long as the buried waste remains a potential source of groundwater contamination.

4. Develop guidance documents or regulations to promote the use of appropriate alternative final cover designs.

5. Evaluate landfill gas detection and collection data at Nevada's larger municipal landfills, and investigate the conditions of landfill gas generation.

4.2 Recycling and Waste Prevention

Nevada has failed to achieve its recycling goal of 25% in the more than ten years since the goal was established by legislation adopted in 1991. While Carson City, Douglas County and Washoe County have made significant progress, minimal recycling is occurring in the rural Counties and Clark County's rate has remained flat. With the majority of the State's population, Clark County's low recycling rate profoundly impacts the statewide rate. Consequently, the greatest opportunities for improving the statewide rate lie in Clark County.

In the last few years, the Division has attempted to highlight the issue of recycling in Clark County and to implement measures to improve recycling activity. In March 2001, the Division co-hosted a Recycling Forum in Las Vegas with the Clark County Health District, with support provided by US EPA Region IX staff. Key stakeholders and citizens were invited to identify barriers to recycling and suggest strategies for improving recycling programs. Some of the findings from this forum are listed as follows.

[1] Murray, Ray et al, An Empirical Model for Vapor Transport in Arid Landfills, City of Tucson Environmental Management

4.2.1 Perceived barriers to recycling in Clark County

- There is no enforceable legal requirement driving recycling. The 25% State recycling goal is simply a goal, not a mandate.

- Recycling is not perceived as an important issue, relative to other issues, by local agencies or elected officials. Consequently, there is little public sector involvement or support for local recycling issues.

- There is no local recycling coordinator to serve as an advocate and source of recycling information.

- Efforts to promote recycling and provide public information and education related to recycling are inadequate.

- Recycling opportunities for apartment dwellers are limited. Curbside collection is not generally available and there are few drop-off centers that accept a range of recyclable materials.

- There is no coordinated effort to encourage recycling in the commercial sector. There is a perception by independent recyclers that the garbage collection franchise inhibits commercial recycling. There is also a problem with sham recycling of construction waste that affects the credibility of commercial recycling as a whole.

- There are no real economic incentives to recycle. Flat, inexpensive residential collection rates with twice weekly garbage collection versus twice monthly recycling collection promote waste generation and disposal rather than recycling.

- There are no local markets for recyclable materials and disposal costs are low. Consequently, recycling of some materials faces unfavorable economic conditions.

- There are concerns over the reliability of recycling information submitted to the Division and used to calculate recycling rates.

Following the Clark County Recycling Forum, a number of actions were taken to address these perceived barriers. The Division launched a modest advertising campaign in the Las Vegas Valley to promote recycling, including television and outdoor advertising. The Division's recycling hotline was advertised and a measurable increase in calls to the hotline was observed. In addition, the Division has provided continued support for the UNLV Rebel Recycling program that provides drop-off recycling service to area residents and the University community. US EPA Region IX presented the manager of the Rebel Recycling program, Tara Pike, with an Environmental Achievement award in 2002.

In 2002 US EPA Region IX also sponsored a study by the Tellus Institute, culminating in a report titled *"Assessing the Potential for Resource Management in Clark County, Nevada."* Resource Management in this context refers to a method of contracting for disposal services where incentives for recycling and waste prevention are built into the contract. Tellus examined franchise agreements for most municipalities in Clark County and assessed the potential for increasing recycling through a resource management approach to franchise contracts. This study provides valuable information that could guide local government leaders and disposal companies toward a win-win revision of existing franchise agreements. Region IX has also provided grant funding to the Clark County Public Education Foundation, a non-profit group in Clark County that set up an educational re-use warehouse. Local institutions and businesses donate materials and tools, including computer equipment that teachers can take back for use in their classrooms.

Obviously, these efforts to improve recycling in Clark County are all constrained by available funding and existing statutory and regulatory authority. There is any number of changes to existing law that would have a beneficial effect on recycling. However, any proposal has to have a constituency sufficient to win legislative approval.

4.2.2 Recycling at Public Buildings

Public buildings continue to present opportunities to reduce waste and increase recycling. Assembly Bill No. 564, passed in the 1999 legislature, amended several statutes related to recycling at public buildings. In general, the revisions:

- Broadened requirements for the recycling programs in Clark and Washoe Counties to ensure the availability of recycling collection services at public buildings;

- Authorized the appropriate rule-making bodies to prescribe procedures for the recycling of paper and other waste materials produced by the following governmental entities:
  - Courts;
  - Legislature;
  - State government offices;
  - School districts; and
  - University of Nevada and Community College System.

- Assigned to the NDEP the responsibility to assist state agencies to develop and carry out recycling programs within state buildings.

Pursuant to the above statutes, the state environmental commission adopted NAC revisions to the municipal recycling program regulations in Ch. 444A and the state agency recycling requirements in Ch. 232. In October 2001 the NDEP issued a model plan for public building recycling programs.

Although the legal authority to implement recycling programs has been significantly broadened, public building recycling programs have achieved only spotty success, even in urban areas where collection services should be available. Barriers to the expansion of public building recycling programs include:

- Lack of space for recycling containers;
- Failure to include recycling provisions in janitorial service contracts;
- Lack of information on availability of recycled material collection service; and
- Solid waste franchise agreements that neither require the franchisee to collect recyclable materials at public buildings nor allow independent recycling businesses to do so.

In an effort to improve recycling at public buildings in Clark County, the Division is administering an EPA grant in 2004 to identify and assess the large public building complexes in the Las Vegas area, identify the recycling services available to them and provide public information about, and facilitate access to, these services.

Strategy

1. Improve information available to businesses on waste reduction and local opportunities for recycling by adding such provisions to the duties of counties with recycling programs adopted pursuant to NRS 444A.040.

2. Improve recycling coordination and public information by establishing a recycling coordinator position at the local level. This could be added to the duties in NRS 444.050 of counties with recycling programs adopted pursuant to NRS 444A.040.

3. Establish an NDEP recycling coordinator position in Las Vegas.

4. Coordinate with local governments and franchisee in Clark County to promote expansion of recycling opportunities for apartment dwellers by providing more drop-off centers.

5. Coordinate with the State Public Works Board and other agencies to promote the allocation of space and facilities for recycling in new public buildings.

6. Seek statutory changes to recycling center reporting requirements with provisions for enforcement to ensure submission of reports, and confidentiality to protect the interests of reporting businesses.

7. Improve accountability of municipalities with approved recycling programs by enforcing the requirements to assess recycling programs every 3 years and make appropriate program changes.

8. Provide State recognition to individuals, institutions and businesses for outstanding efforts to reduce waste and recycle.

9. Investigate the benefits and feasibility of adoption of a State "bottle bill", or beverage container redemption value, as a stimulus to achievement of Nevada's 25% recycling rate goal.

4.3 Importation of Solid Waste

In several areas of the nation waste importation has become a controversial issue. Especially in the east, where space is at a premium, solid waste tends to flow across state lines from areas of higher to lower urbanization. Because the US Supreme Court has ruled that waste is an article of commerce, no state or local government can establish rules that discriminate against disposal of waste based on its state of origin.

Federal landfill standards established in the last decade caused a trend toward regionalization of landfills. As noted above, in addition to the large increases in waste importation recently seen in northern Nevada, both business interests and rural community development planners have begun to market existing, and potential, Nevada disposal capacity to out-of-state customers. A graphic depiction of Nevada's current waste importation is included as Figure 7.

Given these trends and the prohibition against government restrictions on the flow of waste, it appears that Nevada is likely to remain a net waste importer. Therefore, while arguments can be brought pro and con the issue of solid waste importation, it is more fruitful to focus on how Nevada can be better prepared to manage the additional waste in a manner that continues to protect public health and the environment while promoting an ethic of waste reduction and resource conservation.

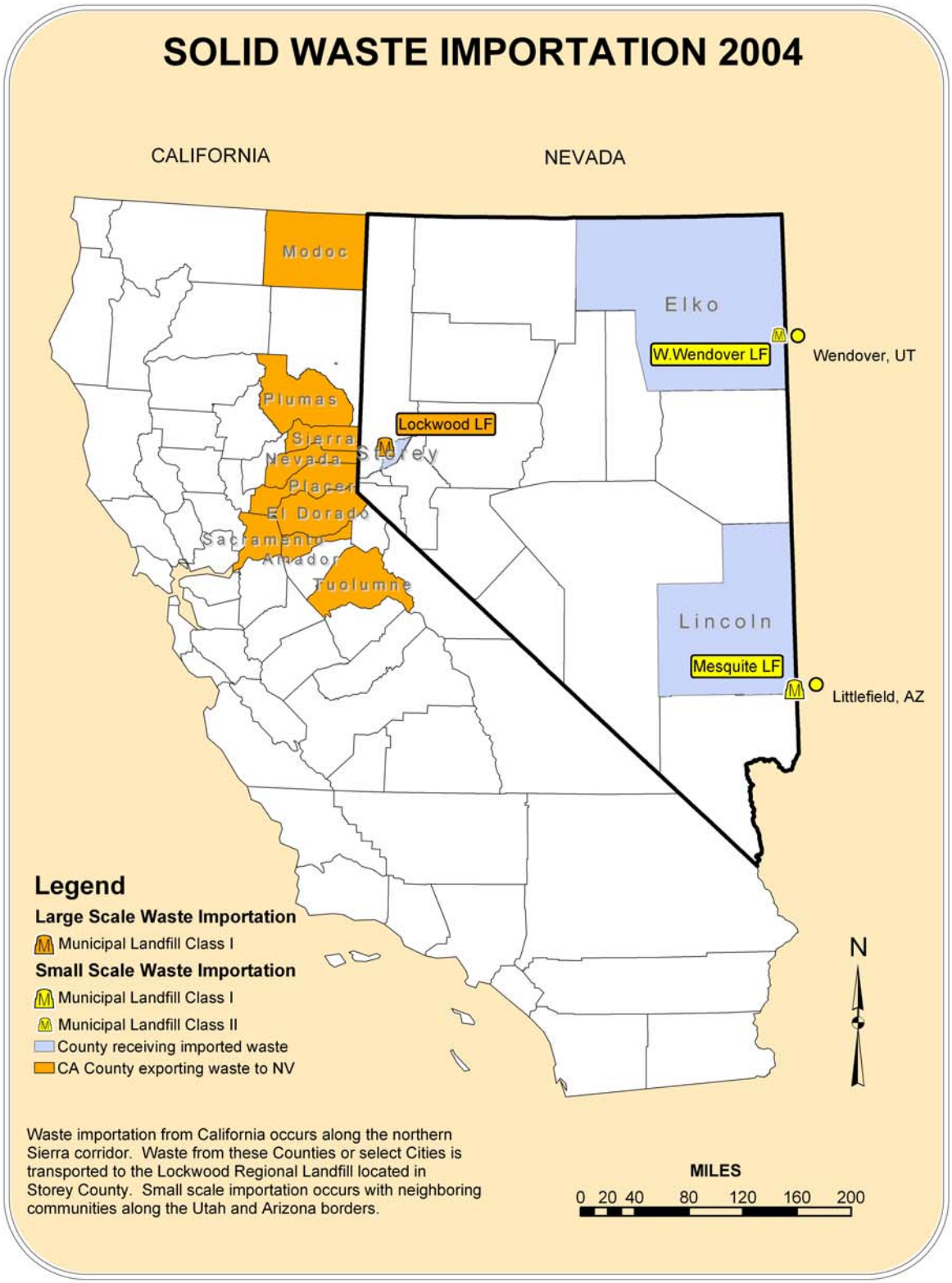


Figure 7. Solid waste importation into Nevada from surrounding states.

There are several ways in which waste importation impacts solid waste management in Nevada:

- Solid waste importation brings with it a regulatory burden - new landfills, transfer stations and transportation mean additional permit application reviews and facility inspections. Industrial and special wastes that are generated in other states bring new regulatory challenges.

- Nevada's revenue for the state solid waste management account comes exclusively from a $1 fee on the purchase of new tires - the account is funded entirely by Nevada residents and businesses. States that send waste to Nevada do not contribute to the cost of regulating waste management.

- When Nevada's waste importation was limited to the small communities of California's eastern Sierra Nevada, the added regulatory burden was insignificant. Now, however, the state solid waste account contains fewer dollars per ton of waste disposed in Nevada than it did in 1990, and the potential exists for this trend to continue. (See Figure 9)

Strategy

In order to provide the resources for regulatory oversight, seek revision of NRS 444.560 to provide authority to the State Environmental Commission to establish permit fees for disposal sites that exceed a disposal rate or capacity threshold.

4.4 Special Waste Management

Special wastes are those that require special handling or disposal because of their physical, chemical or biological characteristics. Special waste types of general concern include waste tires, vehicle batteries and motor oil, household hazardous waste, infectious waste, liquid waste, petroleum contaminated soil, appliances, junk automobiles and electronic wastes. For the most part Nevada's municipal waste programs have developed suitable facilities and procedures for managing these wastes. A few persistent or emerging problems with special wastes are noted below:

4.4.1 Waste Tires

Nevada has adopted regulations governing the management and transportation of waste tires but is one of the few states that still allow the landfilling of whole tires. Because most landfills accept tires, and waste tire haulers are required to document proper disposal, Nevada does not have a large illegal tire dumping problem. This is an inefficient use of landfill space, however,

and many landfill owners/operators in Nevada have noted problems with managing waste tires. Yet tire recycling is costly, and recycling markets have not developed here. Nevada's *Waste Tire Management Plan* (1994) recommends the development of tire-derived fuel (TDF) markets such as cement and lime kilns as a viable means of reducing waste tire landfilling while recovering their energy value.

4.4.2 Household Hazardous Waste (HHW)

Materials that have the characteristics of hazardous waste, if generated in households, are exempt from hazardous waste regulation. While such household wastes as solvents, cleaning compounds and pesticides can be legally disposed in municipal landfills, many citizens and local governments seek environmentally preferable methods for their disposal or recycling. NRS 444A.040 provides that municipalities with populations greater than 40,000 shall have a program for HHW management. In the Las Vegas valley, Douglas County and Carson City, HHW drop-off service is available to residents at no charge. In the Reno-Sparks area it is available through a private hazardous waste management company, although there is a charge for drop-off. While HHW service exists in Washoe, it is unlikely that it serves the purpose of diversion of HHW from the municipal wastestream. Residents are less likely to utilize such a service if they must pay by the pound to do so. Many rural counties collect used vehicle batteries and oil for recycling, but few of them have comprehensive HHW programs.

Elemental mercury has recently received media attention following two separate release incidents – at a middle school and at a private residence, and this attention has caused many citizens to inquire about proper disposal of elemental mercury that has been discovered in household storage or is generated in discarded mercury-containing devices such as thermostats. In response to the incidents, NDEP offered a temporary mercury pickup service for Nevada residents who don't have access to a local household hazardous waste collection program.

4.4.3 Infectious Waste

There are services throughout the state for the collection and disposal of medical waste generated in health care and veterinary facilities. Services for home-generated medical waste sharps are not prevalent, however. "Sharps" are medical instruments such as needles or

lancets. Upon use they may become contaminated with blood-borne pathogens and are considered a special hazard because they can create a route of entry to the body. Sharps pose a health hazard to sanitation workers who transport or work at facilities that manage household waste. While it may never be possible to fully eliminate sharps from the ordinary municipal waste stream, services that encourage diversion could reduce the hazards to sanitation workers.

4.4.4 Electronic Waste

This wastestream includes televisions, home computers, cell phones and other electronic equipment that is generated in increasing quantities in homes, schools and businesses throughout the nation. Some of these wastes fail hazardous waste toxicity characteristic tests and must therefore be managed according to hazardous wastes rules. Most notably, cathode ray tubes (CRTs) – the glass screen component of TVs and computer monitors – typically contain several pounds of lead. The cost to properly dispose of a standard sized monitor, or ship it to a glass recycling facility, can range from $10 to $30 each. Due to such high waste management costs, electronic wastes are often stored indefinitely in warehouses and garages.

The electronic waste problem is not unique to Nevada, and a few states and municipalities have already adopted laws and regulations to identify responsibilities for funding and building the infrastructure to manage this waste. In addition, numerous organizations at the national and international levels have also been working on different aspects of this issue. These include the:

- *National Electronics Products Stewardship Initiative,* a multi-stakeholder effort to develop a financing mechanism for take-back programs;
- *Product Stewardship Institute,* a non-profit organization developing guidance for all phases of product lifecycle;
- *Electronics Industries Alliance* that is trying to develop consensus for a response to the issue within the electronics manufacturing industry; and
- *International Association of Electronics Recyclers,* which has proposed standards and a certification program for electronics recyclers.

Industry leaders are already establishing programs for product re-design and post-consumer product return. Such programs may eventually open clear avenues for the proper management

of electronic waste, but for now, homeowners, businesses and government institutions are uncertain what to do with old electronic equipment.

Strategy

1. Re-evaluate tire landfilling practices and investigate the current potential for TDF and tire recycling markets in Nevada.

2. Provide household hazardous waste startup funding to rural local governments that are willing to cover program maintenance costs.

3. Promote the development of community collection programs for household sharps. Provide public information on existing sharps mail-in programs.

4. The NDEP should continue to participate as a member in the *Product Stewardship Institute* to stay abreast of electronics waste management issues and convey essential information to municipal governments.

5. Municipalities should provide public information that informs local electronics waste generators of the recycling and disposal options available to them.

4.5 Rural Solid Waste Management

A good solid waste management system depends upon an adequate infrastructure, proper equipment, trained personnel and good planning. Solid waste management programs in rural Nevada often face challenges not seen in urban areas:

- A weaker economic base that constrains tax revenue;
- Lack of economies of scale;
- Long transport distances that translate into increased costs; and
- Lack of recycling infrastructure.

All of Nevada's rural landfills, with the single exception of the Crestline landfill in Lincoln County, are owned by rural local governments, and most of them are operated by the public works departments. Although these landfills are exempt from some of the federal landfill criteria, basic standards of location, design, operation, closure/post-closure care and financial assurance still apply. With implementation of these criteria (1993-1997), the needs of rural solid waste infrastructure changed from a few scattered open dumps to engineered solid waste landfills and satellite public waste bin facilities. More equipment was needed – bins for storage, trucks for hauling, dozers, compactors and earthmovers for landfill operations. Personnel needs grew - for landfill attendants, equipment operators, truck drivers and solid

waste management planners. Finally, landfill management and solid waste system planning demand skills and knowledge that depend on training. It is the responsibility of county governments to meet these needs, but in several areas of the state one or more of the elements are deficient, resulting in chronic non-compliance with solid waste regulations.

The Nevada Rural Waste Association (NvRWA), a non-profit organization funded by the US Department of Agriculture, has met some of these needs by assisting rural local governments with grant applications, solid waste planning, researching equipment purchases, technical guidance and training. The NDEP supports the continuation of this program. Other strategies for addressing rural solid waste management systems include:

Strategy

1. In order to improve effectiveness of solid waste personnel, establish a state landfill manager/operator certification program modeled on the wastewater treatment plant operator certification program.

2. Establish a training program to help rural landfill operators meet certification requirements.

3. Establish a grants program through the Division to help rural local governments improve their solid waste management systems through, for example, funding assistance to acquire needed landfill equipment or clean up illegal dump sites.

4.6 Open Dumping and Open Burning

Illegal dumping is a persistent problem in some areas of both rural and urban areas of Nevada. The first condition for reducing illegal dumping is a solid waste management system that provides convenient solid waste services at reasonable prices. Once this is available, municipal governments can address the problem through coordinated efforts of public information and enforcement by local elected officials, law enforcement personnel, prosecutors and judges. NRS 444.621 to 444.645 has provided municipal governments with the authority to prosecute and penalize illegal dumpers. Local efforts should consider whether the following barriers to the control of illegal dumping exist in their communities:

- Inconvenience or high cost of using authorized disposal services and facilities;

- Public habits held over from the era of open dumps without fees;
- Unwillingness to enforce against illegal dumpers in small communities;
- Lack of coordination of efforts among local peace officers, prosecutors and courts to address illegal dumping problems; and
- Economic incentive for waste generators to use the cheapest waste removal service, one that sometimes ends in open dumping.

Open burning of household garbage and non-vegetation refuse is not only a public nuisance but also a threat to public health and the environment due to the emission of toxic substances. The US EPA has determined that such open burning today constitutes the largest source of dioxins released to the environment in the United States, far exceeding the emissions from commercial waste incinerators. Dioxins are carcinogenic substances that persist in the environment and can be taken up in the food chain. Not only can nearby residents be exposed through smoke inhalation, but dioxin that falls out on crops is absorbed by plants and animals and ultimately by human consumers of those products.

To respond to new information on this issue, the NDEP Bureau of Air Quality proposed amendments to the Nevada Administrative Code that would prohibit the use of burn barrels or other open burning in areas where solid waste collection services are available. The amendments would not prohibit the open burning of yard waste or organic agricultural debris, as this activity is considered to be relatively benign. When public workshops were conducted in some rural areas, however, many residents and representatives of agricultural businesses expressed significant opposition. The NDEP withdrew the proposed changes to allow time for further public education and consideration of the reasons for the opposition.

Strategy

1. Provide assistance to rural local government elected officials and staff that want to address illegal dumping problems. This assistance could include:
    - Public information and education;
    - The use of state grants to improve rural solid waste infrastructure
    - On-site workshops to develop local strategies that include all entities and personnel that can influence open dumping.
2. Local governments in jurisdictions where illegal dumping has become a commercial enterprise should consider adoption of a “generator responsibility” ordinance.

3. Conduct public outreach on the risks of open burning and build support for burn restrictions in rural communities.

4. Investigate the benefits and feasibility of adoption of a State "bottle bill", or beverage container redemption value, as a litter reduction measure.

4.7 State and Local Funding

4.7.1 Solid Waste Management Authorities – NDEP and the Health Districts

Funding for solid waste management is provided primarily through the $1 fee per tire sold at retail collected by the State Department. of Taxation and distributed according to the formula:

NV Division of Environmental Protection:	44.5%
Clark County Health District:	30%
Washoe County District Health Dept.:	25%
NV Dept. of Taxation:	0.5%

Figure 8 shows tire fee revenue by fiscal year from 1996 to 2004. This trend roughly approximates the trend in Nevada's population growth. The trend in tons of solid waste disposed, however, shows a greater increase. This is probably due to a combination of increasing waste importation (see Figure 4) and to the increasing construction/demolition wastestream resulting from Nevada's high growth rate. The upper curve of Figure 9 shows the change in ratio of tire fee revenue per ton of waste disposed. In 1992, tire fee revenue brought in about 32¢/ton of waste disposed; ten years later it was 27¢/ton. The lower curve is the same ratio adjusted for an average inflation rate of 2.6% annually. The original 32¢/ton has fallen to 21¢/ton. In constant dollars, the tire fee yields about 1/3 less per ton of waste disposed in 2003 than it did in 1994.

In an attempt to address solid waste management funding needs while ensuring that imported waste supports its share of the cost for solid waste management, the NDEP proposed a modest tipping fee in the 2003 legislative session. This proposal did not have the necessary support and died in committee. A fee on waste to regulate waste is a logical revenue structure, however, and one that has worked in many other states. It also has the advantage of capturing revenue from out-of-state waste, something that the current tire fee does not do.

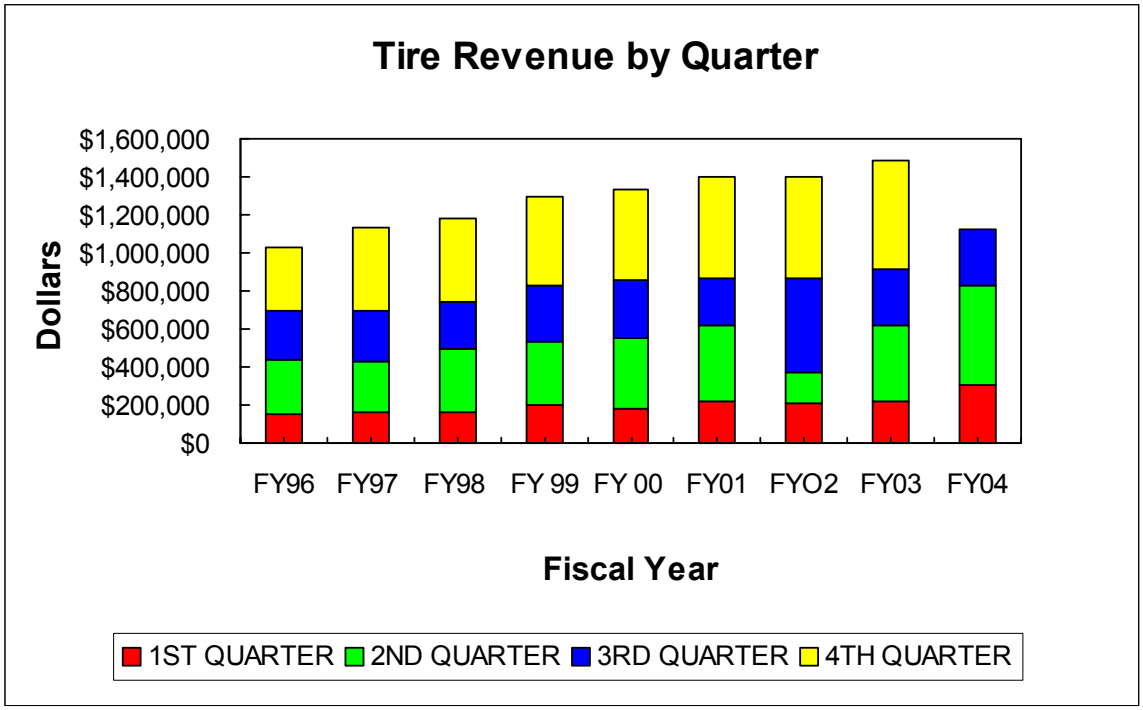


Figure 8. Revenue collected from tire fee for fiscal years 1994 to 2004. Data for the 4th Quarter of 2004 is not yet available.

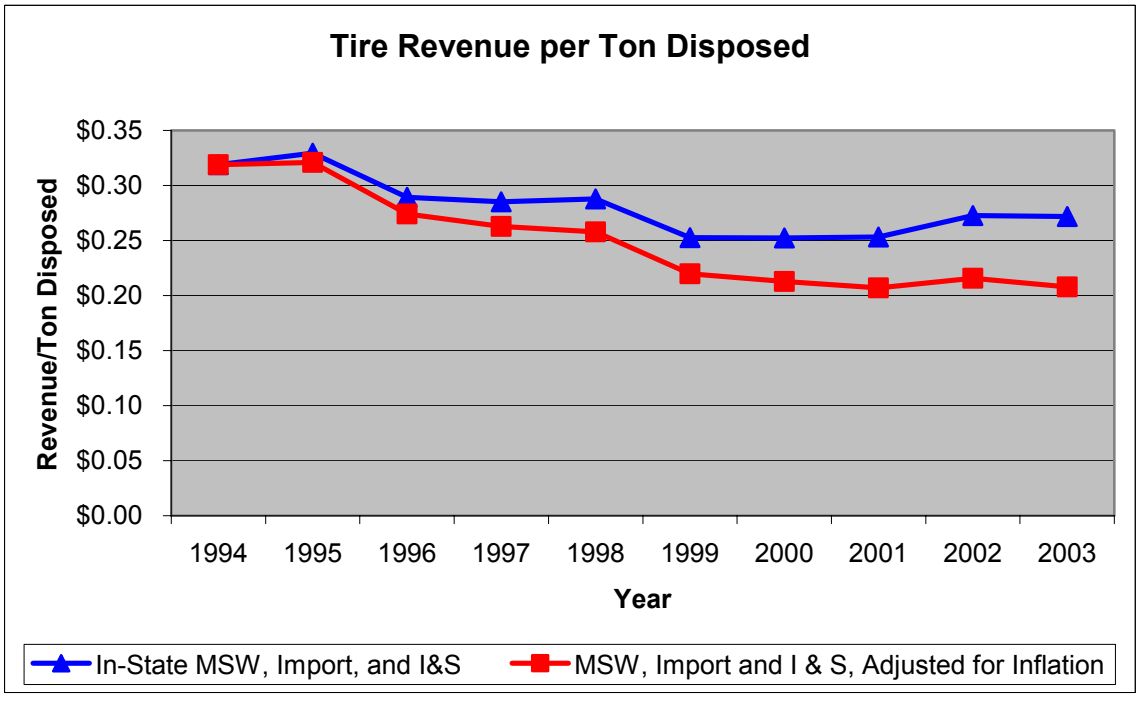


Figure 9. Trend of revenue collected for each ton of solid waste disposed. The red line is deflated pursuant to the average inflation rate of 2.61 for years 1994-2003 (U.S. Department of Labor, Bureau of Labor Statistics, not seasonally adjusted, West urban, all items).

While the above revenue-to-waste analysis suggests that the tire fee revenue may have eroded to the point of insufficiency, it should be noted that the costs to regulate solid waste are not proportional to the tonnage disposed. Regulatory costs are more likely to be influenced by the numbers and types of facilities, and the quality, diversity and sources of solid waste.

Other means of enhancing and maintaining program revenue are open to the health districts, both of which have supplemented the tire fee revenue with permit fees for solid waste haulers and management facilities. The NDEP, however, does not currently have statutory authority to assess permit application and renewal fees.

4.7.2 Local Government

Local government responsibilities include municipal solid waste planning, recycling program development and implementation, public information and the enforcement of illegal dumping. Further, in most of Nevada's rural counties, the community disposal sites are owned and operated by the local government. Local solid waste management may be funded through disposal fees at the gate, property tax assessments, the general fund or a combination of these.

The high cost to operate a municipal landfill in compliance with State regulations has driven the closure of most rural landfills, but remote communities are still faced with the dilemma of either paying for a landfill or for long-distance waste transportation. In some counties budget shortages have led to failure to provide adequate staffing, training, equipment and operating funds, and this, in turn, has led to rural landfills that are chronically in violation of regulations and permit requirements.

Several rural local governments are exploring waste importation as a strategy to generate revenue, not only for solid waste management programs, but also for general fund enhancement. Either the municipality can establish and operate its own commercial landfill, or it can negotiate with a private landfill developer for a "host" fee that generates revenue based on the tons of waste received at the landfill.

Strategy

1. Evaluate funding sources and costs for solid waste management for each rural county. Evaluate need for financial assistance to rural local governments for solid waste management.

2. Seek statutory revisions that allow the NDEP to award grants to rural local governments for the improvement of the local solid waste management system. Define objectives, identify available funding and develop criteria for rural solid waste assistance grants.

3. Seek revision of NRS 444.560 to provide authority to the State Environmental Commission to establish permit fees for disposal sites that exceed a permitted disposal rate or capacity threshold.

4. Investigate the benefits and feasibility of adoption of a State "bottle bill", or beverage container redemption value, as a way to enhance revenue for regulatory oversight of solid waste management and rural local government assistance.

Appendix 1: Amendments to Nevada Revised Statutes and Administrative Codes Related to Solid Waste Management

LEGISLATIVE SOLID WASTE HISTORY SINCE 1993

YEAR	BILL #	SUMMARY	NRS #
1995	AB 449	Raised the county population threshold for requirement to offer curbside collection of recyclables from 40,000 to 100,000	444A.040
1999	AB 564	Clark & Washoe to offer curbside collection of recyclables at public buildings; NDEP to assist state agencies to recycle; school districts to recycle paper	Various
2001	AB 650	General revisions relating to classifications based on population, changed the county population threshold for requirement to offer recycling drop-off centers from 25,000 to 40,000	444A.040
2001	SB 424	Illegal dumping: authorities, enforcement, penalties. Clark Health District may establish hearing officer to adjudicate alleged solid waste violations.	444.621-444.640

NEVADA STATE ENVIRONMENTAL COMMISSION
SOLID WASTE REGULATORY DEVELOPMENT MILESTONES

PETITION	LCB #	PETITION SUMMARY	SEC ADOPTED	EFFECTIVE DATE	NAC CHAPTER
NA	R-183-91	Tire surcharge fees	12/05/1991	01/02/1992	444
NA	R-103-92	Solid Waste Landfill regs for approved Subtitle D program	07/23/1992	09/02/1992	444
NA	R-168-92	Minimum standards for solid waste reduction and recycling programs	09/30/1992	11/10/1992	444A
93008	R-051-93	Solid Waste Landfill permitting program amendments	09/22/1993	11/08/1992	444
9300B	R-043-93	Solid wastes fees out-of-state	09/22/1996	10/29/1993	444
94001	R-051-93	Solid waste facilities management deadlines extensions	09/22/1993	11/08/1993	444
94006	R-208-93	Solid Waste Landfill technical amendments to R-051-93	01/20/1994	03/01/1994	444
94018	R-115-94	Solid Waste addition of "inert waste' definition & standard (withdrawn)	NA	NA	
94019	R-116-94	Solid Waste addition waste tire recycling regulations	11/09/1994	12/16/1994	444A
95008	R-030-95	Solid Waste Financial Assurance Date Extension	10/03/1995	11/09/1995	444
95013	R-035-95	Solid Waste Class II Landfill Two Year Time Extension	10/03/1995	11/09/1995	444
96011	R-071-96	Recycling thresholds & waste tire hauler manifests changes	09/10/1996	10/03/1996	444A
96012	R-072-96	Class II Landfill sites exempt for groundwater monitoring	09/10/1996	10/03/1996	444
97001	N/A	Class II landfills (federal "rifle-shot reforms for rural landfills": daily cover, final cover, gas monitoring	03/06/1997	3/10/1997	444
98003	R-034-98	Transfer station standards and application requirements, 24-hr. landfill operating day, small landfill flexibility, Class III Site revisions	03/25/1998	4/17/98	444
2000-02	R-173-99	Materials Recovery Facility standards and application requirements	12/16/1999	2/9/200	444
2001-03	R-038-01	Recycling at public buildings	09/18/2001	10/25/01	444A
2001-03	R-39-01	Recycling by state agencies- procedures	09/18/2001	10/25/01	444A
2002-12	R-105-02	-Remote open burning of yard waste & extended waste storage -Public Waste Bin facility modifications -MSWLF 5-year capacity survey -Compost plant permit requirements	9/11/02	10/18/02	444

Appendix 2 - Estimated capacities of active landfills in Nevada – 2002

COUNTY	FACILITY NAME	OWNER	OPERATOR	CAPACITY CUBIC YDS	YEAR PERMIT ISSUE	PROJECTED CLOSURE	REMAINING LIFE (YRS)
Carson City	Ormsby Class I & III	Carson City	Carson City	10,900,000	1997	2016	15
Churchill	Russell Pass Class I	City of Fallon	City of Fallon	17,552,500	1998	2101	100
Clark	Apex Regional Class I & III	Republic Silver State	Republic Silver State	81,000,000	1994	2147	46
	Boulder City Class I	Boulder City	Boulder City		1996	2036	35
	Laughlin Class I	Silver State Services	Silver State Services	5,974,000	1994	2019	18
	Wells Cargo Class III	Wells Cargo	Wells Cargo				
Elko	Elko Class I	City of Elko	City of Elko	6,260,000	1999	2057	56
	West Wendover Class II	City of West Wendover	City of West Wendover	184,000	2000	2029	28
Esmeralda	Goldfield Class II	Esmeralda County	Esmeralda County	282,815	1997	2123	22
Eureka	Eureka Class II	Eureka County	Eureka County	250,000	1996	2037	36
Humboldt	Humboldt Regional Class I	Humboldt County	DeLong Construction	2,010,000	1996	2031	30
Lander	New Austin Class II	Lander County	Lander County	260,000	1998	2041	40
	Battle Mountain Class II	Lander County	Lander County	1,052,000	1998	2069	68
Lincoln	Crestline Class II	Crestline Investment Group	Crestline Recycling and Disposal	720,000	1998	2049	48
	Mesquite Class I	City of Mesquite	City of Mesquite	1,785,000	1994	2008	7
Mineral	Hawthorne Class I	Mineral County	Mineral County	1,665,000	1997	2041	40
	Hawthorne Army Depot Class III	U.S. Army	Administrative Contracting Officer	612,000	1997	2017	16
Nye	Pahrump Class I	Nye County	Nye County	353,221	1997	2002	1
	Pahrump Class I Expansion	Nye County	Nye County	210,144	2002	2004	3
	Round Mountain Class II	Nye County	Nye County	698,100	2001	2028	27
	Tonopah Landfill Class II	Nye County	Nye County	144,504	NA	2011	10
Pershing	Lone Mountain Class II	Pershing County	Pershing County	1,873,000	1998	2018	17
Storey	Lockwood Regional Class I	Disposal Services	Disposal Services	64,802,000	1995	2035	34
White Pine	Ely Regional Class I	City of Ely	City of Ely	1,860,500	1998	2082	81