

**Nevada Division of Environmental Protection
Bureau of Waste Management**

**Response to Public Comments on Proposed Alternative Cover Design
for Closure of Trenches 11 and 12, US Ecology Facility, Beatty, Nevada
*April 30, 2009***

RCRA Permit# NEV HW0019, Class 3 Permit Modification

The following response to comments has been prepared by the Nevada Division of Environmental Protection (NDEP) - Bureau of Waste Management (BWM) in regards to written comments received during the public comment period for a proposed permit modification for the US Ecology Nevada, Inc. (USEN) hazardous waste management facility located near Beatty, Nevada. The class 3 permit modification of RCRA Permit HW0019 authorizes the construction of an alternative cover for the closure of Trench 11 and Trench 12.

One comment was received during the public comment period for the proposed permit modification. No request for a public hearing was received; and therefore, no meeting was held in this matter. A copy of this response to comments shall be sent to the permittee and to those who submitted written comments in accordance with the requirements of 40 CFR 124.15 and 124.17 and as adopted by reference in NAC 444.8632.

The only comments received were from Ms. Linda Meyer of the US EPA Region 10 Seattle, Washington office, via an e-mail dated October 1, 2008. The specific comments provided by EPA Region 10 are provided below in italics, along with the respective NDEP response as follows:

Comment 1 – *Alternative Cover:* *EPA’s regulations concerning closure of RCRA subtitle C landfills containing hazardous waste require the use of a hydraulic barrier in order to minimize infiltration into the waste. If an alternative cover is selected, then a demonstration should be provided reflecting how the alternative cover performs at least as well or better than the required RCRA required cap.*

NDEP Response to Comment 1: The NDEP appreciates the concern for an appropriate cover design that will minimize infiltration. The evapotranspiration (“ET”) alternative cover proposed for the closure of Trenches 11 and 12 would be constructed of soil without incorporation of a synthetic liner as a hydraulic barrier. In regard to the specific cover design, the NDEP understands the objective of EPA’s RCRA regulation and guidance for hazardous waste landfills is for a “performance standard” that is protective by allowing little or no water to pass through the cover. Given the desert climate and local site conditions, the NDEP has determined that the proposed ET cover design can

reasonably achieve this performance standard at the US Ecology facility, noting the following supportive information.

The predictive modeling performed by AquAeTer demonstrates the protectiveness of the ET soil cover. US Ecology's "Design Basis and Construction Specifications for Trenches 11 and 12 Final Covers", dated April 2008 provides a modeling analysis of the proposed ET cover. The modeling shows, given the site specific conditions, that an ET soil cover with a three foot thickness would effectively prevent and limit water from penetrating into the buried waste material.

Additionally, Mr. Steve Rock, Senior Environmental Engineer with the US EPA National Risk Management Research Laboratory in Cincinnati, Ohio, noted that the site is one of the driest in the country, and that site specific data has been gathered by the USGS which has a research station nearby (see attached comments by Steve dated February 9, 2009 and April 24, 2009). In a 2007 report, the USGS indicated long-term average annual precipitation for the site as 112 mm (approx. 4.25 inches) based upon precipitation records over a 25 year period from 1981–2005. In his review of the alternative cover design, Mr. Rock conducted a water balance analysis for Trench 11 using real time site-specific data from 1991 to 2008. The water balance reflected the site conditions of Trench 11, without any benefit of a permanent cover, and analyzed the volume of water entering and leaving Trench 11. Water entering Trench 11 came from precipitation events and water application for dust suppression by US Ecology. Water leaving Trench 11 came from leachate collection and evapotranspiration. Mr. Rock concluded that "the water balance is overwhelmingly on the side of evapotranspiration for this site, even before the placement of the cover system. The water balance analysis is conservative considering that after closure an engineered earthen ET cover would be constructed over the landfill. The cover will enhance the ET process by providing a better sponge for holding rainwater for evaporation, and by providing a stable place for vegetation." The EPA review also noted that "the atmospheric data collected from the USGS site and some simple calculations show that the ET landfill cover would be very protective at this site."

Comment 2 - *Inappropriate use of 40 CFR § 264.110(c): Section 2 of USEN's Design Basis and Construction Specifications for Trenches 11 and 12 Final Covers (Trench 11 and 12 Design), dated April 2008, misapplies 40 C.F.R. 264.110(c), citing that the regulated landfill unit is situated among pre-RCRA solid waste management units, then stating the proposed alternative cover is consistent with RCRA. The final cover not only needs to be consistent, it needs to be compliant and at least, if not more, protective than the final cover required under RCRA. USEN has listed the following benefits of the proposed alternative cover: ease of obtaining construction material, simplicity of construction, reduced complexity of quality assurance/quality control, increased long-term cover integrity and stability, and simplified cover maintenance. While many of these benefits are short-term benefits to the company, they should not be viewed as more important than meeting the regulatory requirements, which provide the best protection to human health and the environment in the long-term.*

Section 2 of the Trench 11 and 12 Design states that RCRA regulations incorporate flexibility to allow closure approaches that differ from the specific requirements of 40 CFR § 264.310(a), but continue to provide long-term environmental protection. Specifically, 40 CFR § 264.110(c) states:

The Regional Administrator may replace all or part of the requirements of this subpart (and the unit-specific standards referenced in §264.111(c) applying to a regulated unit), with alternative requirements set out in a permit or in an enforceable document (as defined in 40 CFR 270.1(c)(7)), where the Regional Administrator determines that:

- (1) The regulated unit is situated among solid waste management units (or areas of concern), a release has occurred, and both the regulated unit and one or more solid waste management unit(s) (or areas of concern) are likely to have contributed to the release, and*
- (2) It is not necessary to apply the closure requirements of this subpart (and those referenced herein) because the alternative requirements will protect human health and the environment and will satisfy the closure performance standard of § 264.111 (a) and (b).*

EPA Region 10 disagrees with the use of this flexibility in this circumstance and believes that the closure performance standards required under RCRA 40 CFR § 264.310 must be met. In the preamble to the development of 40 CFR § 264.110(c), (Federal Register (FR) Volume 63, Number 204, October 22, 1998, Pages 56710-56733); the Agency states that it intended this flexibility to be applied to regulated units in close proximity to Solid Waste Management Units (SWMUs) where releases have occurred. The purpose of this rule was to impose consistent remediation standards for SWMUs and regulated units that were contributing to the same environmental contamination. EPA promulgated the final rule on October 22, 1998, allowing replacement of regulatory requirements of Subparts F, G, and H at certain regulated units with alternative requirements developed under a remediation authority.

The preamble to the final rule acknowledged that the closure procedures were developed early in the RCRA program and were not originally designed to address the complexity and variety of issues involved in remediation. The preamble further stated that the new provisions were developed to address environmental needs at certain closing regulated units with more flexible, but protective, site-specific requirements developed through a remediation process, and to provided greater flexibility for the clean-up of the regulated unit. The final rule allows the Regional Administrator to use the new standards to integrate the clean-up requirements for the regulated unit into the requirements for the SWMUs developed under remediation authorities. EPA's goal with this rule, as reflected in the Agency's response to comments, as applied to regulated units, is to have one remediation process if there are releases from multiple sources (SWMUs and regulated units). Use of 40 CFR § 264.110(c) is inappropriate for the USEN site, since there does not appear to be remediation anticipated for the regulated unit and/or SWMUs that would be conflicting or inconsistent with the RCRA closure standards.

NDEP Response to Comment 2: NDEP concurs that the reference to 40 CFR § 264.110(c) may have been inappropriate given the site-specific conditions at the USEN facility.

Comment 3 - Landfill Liner Permeability: *40 CFR § 264.310 (a)(5) requires that the final cover have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present. The Trench 11 and 12 Design calculates a percolation rate of 3.2×10^{-8} cm/sec through the alternative cap and compares this to the prescribed landfill liner permeability in 40 CFR § 264.301(c)(1)(i)(B) of 1×10^{-7} cm/sec. The landfill liner permeability required in the regulations of 1×10^{-7} cm/sec is the permeability for the bottom soil layer beneath a geomembrane. These two layers constitute the 40 CFR § 264.301(c)(1)(i)(B) bottom liner, while the top liner required pursuant to 40 CFR § 264.301(c)(1)(i)(A) is also expected to be constructed of a geomembrane. These two parts, top liner and two layer bottom liner required under 40 CFR § 264.301(c)(1)(i)(A) and 40 CFR § 264.301(c)(1)(i)(B) constitute the landfill liner system. Infiltration/ percolation through the alternative cap for Trench 11 and 12 must be compared to the permeability of the landfill liner system, not just the requirement of the regulation. USEN has not provided calculations in the Trench 11 and 12 Design demonstrating that the cap permeability of 3×10^{-8} cm/sec will meet 40 CFR § 264.310(a)(5).*

NDEP Response to Comment 3: As noted in the NDEP Response to Comment 1 above, the ET alternative soil cover design proposed for Trenches 11 and 12 relies on evaporation and plant transpiration to minimize water penetration below the cover. As such, a stringent interpretation to apply a permeability test standard is not appropriate for the proposed cover system at this location. One cannot reasonably measure an ET cover using the same laboratory test as conducted on a synthetic liner. However, the ET cover's ability to limit water penetration can be assessed through modeling, water balances and the use of various monitoring techniques. The NDEP has accepted the alternative cover design as providing a comparable level of protective performance at this location.

Additionally, based upon communications with US EPA Region 9 and Mr. Steve Rock, the NDEP understands that while the regulation states there should be an equivalent or better permeability in the cover as in the bottom liner, the US EPA also published guidance in 1992 intended to clarify the intent of the regulation and which allowed for exceptions as technology and design knowledge improve. This supplement guidance provided recommended minimum designs for final covers and confirmed flexibility in the regulations related to the use of alternative designs. It has been noted that while the guidance may be due for updating, the 1992 EPA wording did anticipate a better understanding of earthen covers, and in the seventeen years since publication, the use and appropriate application of ET covers has become more predictable.

Comment 4 - Post Closure Verification: *EPA Region 10 is concerned with the protectiveness of the post-closure verification for the final cover performance proposed on page 10 of the Trench 11 and 12 Design. USEN has proposed to assess landfill*

leachate quality and quantity and conduct groundwater monitoring to assess the final cap performance. Since all landfills will continue to generate some amount of leachate and the proposed cap does not eliminate infiltration into the landfill, it will be impossible to develop criteria for cap success or failure based on leachate characteristics. In addition, if the lower landfill liner fails the leachate monitoring is meaningless. USEN has acknowledged existing impacts to the groundwater from the SWMUs in the vicinity of the Trenches. As there have already been impacts to the groundwater, developing meaningful groundwater-based triggers corresponding to cover performance is impossible. If the alternative cap is permitted the post-closure monitoring plan must include meaningful monitoring of infiltration through the cover.

NDEP Response to Comment 4: As noted in the NDEP Response to Comments 1 and 3 above, both the predictive modeling and water balance analysis indicate that an ET cover can be expected to be sufficiently protective, considering site-specific conditions at the USEN location. However, the NDEP also appreciates the value of measuring the specific performance of placed covers; and as such, the NDEP will require that USEN facility take the following actions:

1. Propose a cover performance monitoring system and protocol for approval by NDEP. Such a monitoring system could include two or more drainage lysimeters (10 meter by 20 meter each) under the ET cover of Trench 11 to monitor moisture migration. Data from the monitoring of Trench 11 may be used by the NDEP to assess the need for similar monitoring for the cover of Trench 12 after it closes.
2. Continue monthly monitoring of the leachate collection sumps. If a statistically significant increase occurs in leachate generation after the ET cover is installed, the permittee shall notify NDEP in writing within 30 days of discovery and develop a proposed action plan.

Comment 5 - Use of 25 Year Storm for Alternative Cover Design: *Page 28, USEN used the 24-hour, 25-year storm of 2 inches to calculate the moisture holding capacity required for the cover the basis for selecting a 25 year storm should be provided. It seems that the design should consider at least a 100 year storm for design purposes.*

NDEP Response to Comment 5: It should be noted that throughout the RCRA regulations, the design storm basis is a 25-year, 24-hour event as provided in the submitted design proposal. Regardless, at this site the difference between the 25-year storm and the 100-year storm is not significant. The 100-year event yields a storm of only 2.75 inches which would not appreciably alter the results. The largest storm recorded since measurement began in 1937 is less than twice a normal storm event for this climate.

Comment 6 - Guidance supports using standard RCRA cover design: *EPA's Technical Guidance Document EPA/530-SW-89-047 for Final Covers on Hazardous Waste Landfills and Surface Impoundments states: "In all cases where a FML is used in the bottom liner, one should also be used in the cover". Due to the uncertainty of modeling, climate change, and the hazardous nature of the waste left in place, EPA*

Region 10 believes this requirement should not be waived for regulated RCRA hazardous waste disposal units.

NDEP Response to Comment 6: Comment noted, see NDEP Responses to Comments 1 and 3 above. It should be noted that both Trench 11 and 12 have fully-engineered, synthetically-lined, leak-detected, RCRA-compliant liner systems, and that waste disposal in these trenches is subject to the ban on disposal of liquids. Wastes disposed in Trench 11 and 12 are treated to eliminate free liquids and ensure limited leachability. Additionally, both trenches have functional leachate collection systems. Given the engineered systems in place, the waste treatment practices, and the provided technical analyses, and with special consideration of the unique climate and geography of the location, the proposed alternative cover design is reasonably expected to perform as well as the prescriptive design referenced by the commenter.

P:\BWM\HW Permits\American Ecology Inc. (TSD)\Current and Renewal Permit\2005 Permit Renewal\2005 FINAL PERMIT\MODS\Revision 3-class3mod2-draftpermit\Records\Response-to-comments-Alt Cover-final-Sree-04-30-09.doc

Attachment 1 to NDEP Response to Comments dated 4/30/09

Steve Rock's comments received via email February 9, 2009

The two concerns expressed in the “Comments on the Proposed Alternative Cover of the US Ecology Nevada...” are about the cover protectiveness and how can the cover be accepted under the current regulation and guidance. I have tried to address those concerns by making a very simple water balance using data collected in real time from the site and the adjacent USGS study site. Brian Andraski of the USGS provided me with access to their data (These reports include some actual-ET and soil-moisture data. Soil moisture monitoring of the devegetated-native-soil site & the two nonvegetated-test-trenches has been ongoing since 1987-88.

Johnson, M.J., Mayers, C.J., Garcia, C.A., and Andraski, B.J., 2007, Selected micrometeorological, soil-moisture, and evapotranspiration data at Amargosa Desert Research Site in Nye County near Beatty, Nevada 2001-05: U.S. Geological Survey Data Series 284, 29 p. (<http://pubs.water.usgs.gov/ds284>)

Garcia, C.A., Johnson, M.J., Andraski, B.J., Halford, K.J., and Mayers, C.J., 2008, Portable chamber measurements of evapotranspiration at the Amargosa Desert Research Site near Beatty, Nye County, Nevada, 2003–06: U.S. Geological Survey Scientific Investigations Report 2008–5135, 10 p. (<http://pubs.usgs.gov/sir/2008/5135/>)

I think that the relevant guidance addresses the bathtub effect and provides for flexibility by anticipating improvement in technologies or in our understanding and use of existing technology.

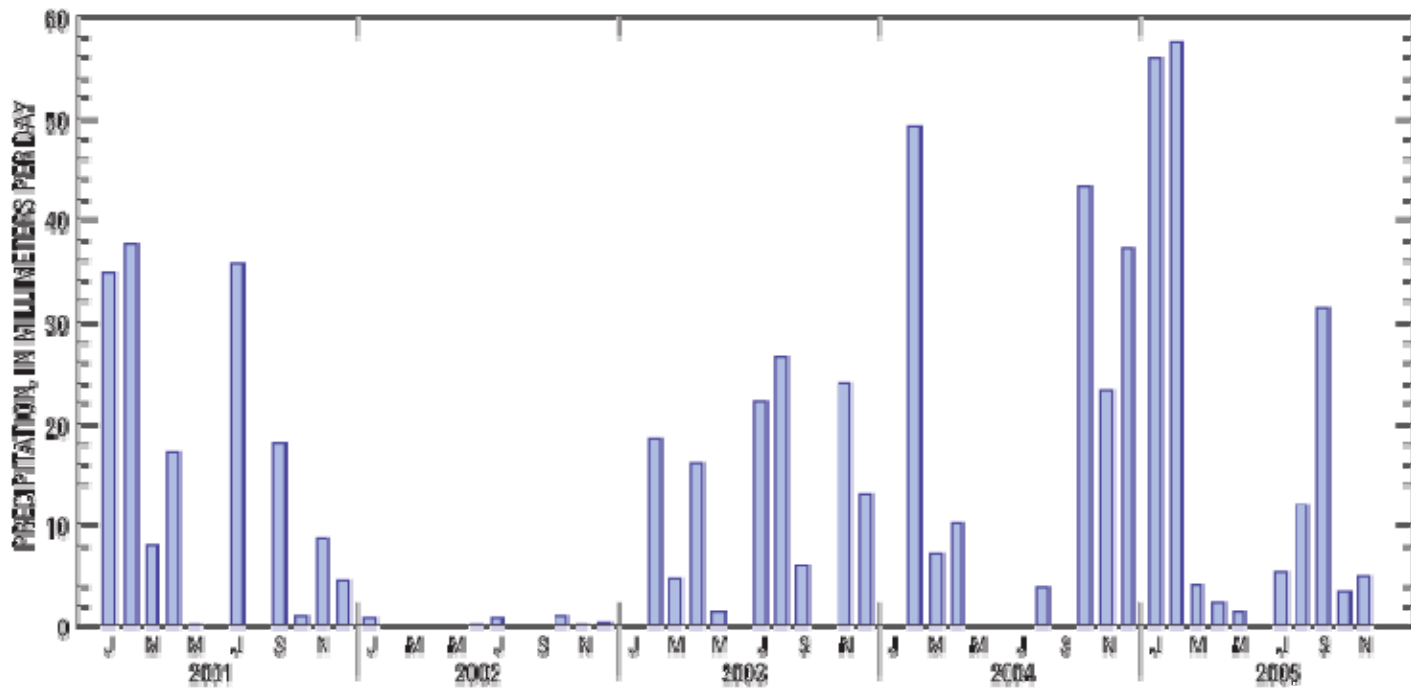
Below is a compilation of the leachate data collected on site, the atmospheric data collected on the USGS site and some simple calculations that slice through the modeling presented with the Design to show that ET is very protective at this site.

Water Balance

US Ecology leachate collection
1990-2008

	c1	c3	c4	d1	d2	d3	d4
1990	0	0		0	0	165	
1991	0	4,412	0	80	282	3,273	215
1992	0	7,381	26,472	130	1,310	3,522	2,203
1993	85	19,904	185,209	185	910	3,527	6,402
1994	0	5,487	40,097	0	142	262	331
1995	240	43,899	82,920	0	2,212	11,105	18,770
1996	0	18,358	27,381	0	0	12	696
1997	80	20,584	28,334	0	333	124	1,278

1998	0	55,320	193,100	330	2,338	605	1,653	
1999	0	9,542	58,668	0	45	236	76	
2000	0	16,656	54,773	74	0	1,418	0	
2001	0	10,312	41,667	0	0	1,152	0	
2002	0	7,443	43,296	0	0	1,176	0	
2003	0	10,955	44,926	0	0	602	98	
2004	0	5,578	46,270	0	55	273	62	
2005	0	10,312	41,667	0	0	1,152	0	
2006	0	1,685	5,325	0	1,561	288	1,665	
2007	0	2,491	18,985	0	782	1,060	2,265	
2008	0	525	19,170	0	125	245	6,156	
	405	250,844	958,260	799	10,095	30,197	41,870	1,292,470



In 2002 total recorded precipitation was about 3.5 mm (less 1.5 inches). In every month for the past five years the PET for the site exceeds the precipitation as recorded by the USGS research station adjacent to the US Ecology site.

Applied water for dust suppression between 1991 and 2008 was about 21.7 million gallons (16,695,000 clean water and 5,095,648 non-haz liquid). About 1.3 million gallons of leachate were collected over the same period. About 100,000 gallons per acre fall on the site on an annual average, or 1.2 million gallons (*later changed by Steve from 1 to 1.2*) from 1991 to 2008 from precipitation. A very simple equation shows that precipitation and applied water equal ET and leachate collected.

21.7 + 21.6 (later changed by Steve from 1.8 to 21.6) – 1.3 = ET of 42 million gallons (later changed by Steve from 22.2 to 42), over ten times the total precip for the site (*this comment is based on the previous numbers*).

The water balance is overwhelmingly on the side of ET for this site, even before the placement of the cover system.

Regulatory acceptance

A permeability test or standard is not appropriate for this proposed cover system. One cannot measure an ET cover using the same lab test as you can a synthetic cover.

A permeability test or standard is not necessary for this proposed cover system. The regulation does state that there should be an equivalent or better permeability in the cover as in the bottom liner, but in 1992, the US Environmental Protection Agency (USEPA) published a guidance intended to clarify the intent of the regulation. This supplement provided recommended minimum designs for final covers and confirmed flexibility in the regulations related to the use of alternative designs. The following excerpt from the Federal Register (Vol. 57, No. 124, 1992, p. 28627):

“EPA established the requirement for a final cover infiltration layer, which includes a permeability standard, to prevent the “bathtub effect” from occurring. The “bathtub effect” occurs when a landfill fills up with liquids because the infiltration layer of the final cover is more permeable than the bottom liner system or natural subsoils present ... EPA intended, and has always interpreted the language in this section to be a performance standard that requires the permeability of the final cover be less than or equal to that of the bottom liner system or natural subsoils present, whichever is less.....”

“While this standard does not explicitly require the use of a synthetic membrane in the final cover, the Agency anticipates that if a MSWLF has a synthetic membrane in the bottom of the unit, then the infiltration layer in the final cover will, in all likelihood given today’s technologies, include a synthetic membrane as part of the final cover. This is so because it generally is not currently possible to have an earthen material infiltration layer as part of the final cover that has a permeability of less than or equal to the permeability of a synthetic membrane... “

While it is true that no earthen cover can achieve the permeability of a synthetic material, the comparison is flawed. The water balance for this site shows that ET covers can be protective despite not being impermeable. The guidance above, while apparently restricting the available technology, actually make allowance for exceptions as technology and understanding increases.

The two key points are that the regulation and guidance are aiming for a “performance standard” that is protective by allowing little or no water to pass if the bottom has an

impermeable liner. In this climate, at this site, given the fact that little if any water can penetrate an ET cover, this performance standard would be met.

The second key point in the guidance is the flexibility implied in the wording, “in all likelihood given today’s technologies” and “it is not currently possible.” Written in 1992 it was understood that technologies change. In the seventeen years since publication of this guidance, the use and appropriate application of ET covers has become a great deal more predictable.

While the guidance is due for updating, the 1992 wording does anticipate a better understanding of earthen covers, and we currently have that better understanding.

P:\BWM\HW Permits\American Ecology Inc. (TSD)\Current and Renewal Permit\2005 Permit Renewal\2005 FINAL PERMIT\MODS\Revision 3-class3mod2-draftpermit\Records\Steve Rock Comments-02-09-Attch1.doc

Attachment 2 to NDEP Response to Comments dated 4/30/09

Mr. Steve Rock - US EPA Comments received via email April 24, 2009

Additional comments about the proposed ET cover at the US Ecology site in Beatty, NV.

The Beatty, Nevada site is uniquely situated for an ET cover evaluation for two main reasons: There is an excellent and relevant data set that has been coincidentally collected adjacent to the site, and there have been recent comparison tests conducted on conventional and ET covers in similar climates.

Although the site itself has not been extensively studied, literally adjacent to the site is a USGS test facility that has collected very extensive data on the climate and its effects. There is a long and detailed record of weather, but what makes this research station especially interesting to the evaluation of an ET cover is the detailed and long term measurement and calculation of evaporation and transpiration that the USGS has performed and published. Few, if any other sites have access to such pertinent data. These data makes a compelling case for ET as an effective cover for this site.

This site is also located in a climatic zone that is arid and comparable to the Alternative Cover Assessment Program (ACAP) test facilities in San Bernardino County, California and Monticello, Utah. Other ACAP facilities in semi-arid regions also provide good comparisons. The ACAP program tested ET covers in comparison to conventional covers in the field over five years. The ET covers in those sites performed equivalently to the conventional covers that were installed and tested at the same time.

Table 1 Water balance results.

Site Location	Cover Design	Data Year (days)	Precipitation (mm)	Drainage	
				mm	As % of precipitation
Altamont CA	ET	11/10/00 -6/30/01 (231)	222	1.5	0.67%
		7/1/01 - 6/30/02 (365)	287	1.5	0.52%
		7/1/02 - 6/30/03 (365)	425	2.5	(0.59%)
		7/1/03 -6/30/04 (365)	291	64.5	(19.91%)
		7/1/04 - 10/4/04 (95)	9	0	(0.11%)
		Annual Average		14	(4.36%)
	Membrane Composite	11/10/00 -6/30/01 (231)	222	0.0	0.00%
		7/1/01 - 6/30/02 (365)	287	0.0	0.00%
		7/1/02 - 6/30/03 (365)	425	4.0	0.94%
		7/1/03 -6/30/04 (365)	291	0.2	0.07%
		7/1/04 - 10/4/04 (95)	9	0.0	0.00%
		Annual Average		0.8	0.20%

Site Location	Cover Design	Data Year (days)	Precipitation (mm)	Drainage	
				mm	As % of precipitation
Apple Valley CA	ET	4/25/02 -6/30/02 (66)	0	0.0	0.00%
		7/1/02 - 6/30/03 (365)	86	0.4	0.47%
		7/1/03 - 6/30/04 (365)	106	0.0	0.00%
		7/1/04 - 9/22/04 (77)	7	0.0	0.00%
		Annual Average		0.1%	0.12%
	Membrane Composite	4/25/02 -6/30/02 (66)	0	0.0	0.00%
		7/1/02 - 6/30/03 (365)	86	0.0	0.00%
		7/1/03 - 6/30/04 (365)	106	0.0	0.00%
		7/1/04 - 9/22/04 (77)	7	0.0	0.00%
		Annual Average		0.0	0.00%
	Compacted Clay	4/25/02 -6/30/02 (66)	0	0.0	0.00%
		7/1/02 - 6/30/03 (365)	86	0.0	0.00%
		7/1/03 - 6/30/04 (365)	106	0.2	0.19%
		7/1/04 - 9/22/04 (77)	7	0.3	4.29%
		Annual Average		0.13	1.12%
Boardman OR	ET Thin	12/9/00 -6/30/01 (203)	75	0.0	0.00%
		7/1/01 - 6/30/02 (365)	164	0.0	0.00%
		7/1/02 - 6/30/03 (365)	185	0.0	0.00%
		7/1/03 - 6/30/04 (365)	177	0.0	0.00%
		7/1/04 -10/4/04 (95)	20	0.0	0.00%
		Annual Average		0.0	0.00%
	ET Thick	12/9/00 - 6/30/01 (203)	75	0.0	0.00%
		7/1/01 - 6/30/02 (365)	164	0.0	0.00%
		7/1/02 - 6/30/03 (365)	185	0.0	0.00%
		7/1/03 - 6/30/04 (365)	177	0.0	0.00%
		7/1/04 -10/4/04 (95)	20	0.0	0.00%
		Annual Average		0.0	0.00%
	Membrane Composite	12/9/00 - 6/30/01 (203)	75	0.0	0.00%
		7/1/01 - 6/30/02 (365)	164	0.0	0.00%
		7/1/02 - 6/30/03 (365)	185	0.0	0.00%
		7/1/03 - 6/30/04 (365)	177	0.0	0.00%
		7/1/04 -10/4/04 (95)	20	0.0	0.00%
		Annual Average		0.0	0.00%
Polson MT	ET with Capillary Break	11/19/99 - 6/30/00 (224)	215	0.0	0.00%
		7/1/00 – 6/30/01 (365)	358	0.18	0.05%
		7/1/01 - 6/30/02 (365)	308	0.39	0.13%
		7/1/02 - 6/30/03 (365)	326	0.19	0.06%
		7/1/03 - 6/30/04 (365)	254	0.20	0.08%
		7/1/04 – 10/4/04 (95)	87	0.0	.00%

Site Location	Cover Design	Data Year (days)	Precipitation (mm)	Drainage	
				mm	As % of precipitation
		Annual Average		0.2	0.06%
		11/19/99 - 6/30/00 (224)	215	0.29	0.13%
	Membrane Composite	7/1/00 - 6/30/01 (365)	358	1.16	0.32%
		7/1/01 - 6/30/02 (365)	308	0.0	0.00%
		7/1/02 - 6/30/03 (365)	326	0.0	0.00%
		7/1/03 - 6/30/04 (365)	254	0.5	0.20%
		7/1/04 - 10/4/04 (95)	87	0.33	0.38%
		Annual Average		0.38	0.17%
Monticello UT	ET with Capillary Break	8/12/00 - 6/30/01 (323)	393	0.0	0.00%
		7/1/01 - 6/30/02 (365)	213	0.0	0.00%
		7/1/02 - 6/30/03 (365)	342	0.0	0.00%
		7/1/03 - 6/30/04 (365)	315	0.1	0.03%
		7/1/04 - 10/3/04 (94)	148	0.0	0.00%
		Annual Average		0.02	0.01%

P:\BWM\HW Permits\American Ecology Inc. (TSD)\Current and Renewal Permit\2005 Permit Renewal\2005 FINAL PERMIT\MODS\Revision 3-class3mod2-draftpermit\Records\Steve Rock Comments-04-09-Atch2.doc