

# AN ALTERNATIVE TO PRESCRIPTIVE STANDARDS IN HAZARDOUS WASTE REGULATION: SUBPART K AND PERFORMANCE-BASED STANDARDS FOR ACADEMIC LABS

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## INTRODUCTION

A veteran Environmental Protection Agency (EPA) inspector entered a lab on the University of Wisconsin campus, observed shelf after shelf of hazardous substances stored in small vials and jars, and remarked that in all his years of inspecting hazardous waste facilities, he had never seen hazardous substances stored in anything smaller than fifty-five-gallon drums.<sup>1</sup> Such a reaction aptly exemplifies EPA's relationship with college and university labs since the enactment of the Resource Conservation and Recovery Act (RCRA) in 1976. Over the past thirty years, the focus of EPA's hazardous waste regulation has been on large industrial facilities. This is largely due to the fact that college and university labs account for less than one percent of the total hazardous waste production in the United States.<sup>2</sup> College and university labs have thus experienced difficulty in meeting RCRA standards designed for industrial settings, and their often futile efforts have only led to high costs and steep fines, sometimes reaching hundreds of thousands of dollars.<sup>3</sup>

The central problem is that industrial facilities tend to generate very large amounts of a small number of chemicals, whereas college and university labs, and research labs more generally, tend to generate very small amounts of a large number of chemicals.<sup>4</sup> Specifically, college and university labs have had difficulty meeting the complex and detailed record-keeping requirements and storage time

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1. Peter A. Reinhardt, *What EPA Does Not Understand About Academic Laboratories*, in WASTE DISPOSAL IN ACADEMIC INSTITUTIONS 55 (James A. Kaufman ed., 1990).

2. Mary Corrigan, *How Hazardous Waste Regulations Apply to University Research Laboratories*, Apr. 16, 1996, <http://www.abrf.org/ABRFNews/1996/March1996/mar96hazwaste.html>.

3. Cheryl Hogue, *Campus Hazard*, CHEM. & ENG'G NEWS, Nov. 22, 2004, at 43-48.

4. *Academic Labs Urge Performance-Based Approach in EPA RCRA Rule*, INSIDE THE EPA, Apr. 7, 2006, § 14.

limits of RCRA.<sup>5</sup> Colleges and universities have been petitioning EPA for over twenty years to create alternative regulations specifically designed for the research lab environment. In 1983, Congress ordered EPA to report on the problem of hazardous waste compliance by college and university labs.<sup>6</sup> While the final report, prepared by a private consulting firm, contained such reform recommendations as the simplification of hazardous waste identification requirements and the extension of storage time limits, EPA did not agree to modify any regulations and instead simply indicated to Congress that such changes were possible.<sup>7</sup>

Twenty-three years later, in May 2006, EPA finally took steps to implement much-needed and long-overdue changes to RCRA.<sup>8</sup> EPA's proposed rule, referred to as Subpart K, would create a new set of performance-based standards specifically for college and university labs under RCRA, allowing academic labs more flexibility to meet EPA requirements.<sup>9</sup> Contrary to prescriptive standards, which require regulated entities to reach certain health-based and environmental-based goals in a specific manner, performance-based standards maintain these goals while allowing regulated entities to determine the manner in which the goals are reached.<sup>10</sup> While Subpart K appears to embody the reforms for which college and university labs have petitioned for years, it is questionable whether the proposed rule goes far enough in certain respects to remedy the unique problems of academic labs, whether it goes too far in other respects, and whether performance-based standards are even appropriate for hazardous waste regulation.<sup>11</sup>

#### I. UNIQUE CHALLENGES OF HAZARDOUS WASTE REGULATION IN ACADEMIC LABS

The purpose of RCRA is to protect human health and the environment from the potential dangers of hazardous waste disposal.<sup>12</sup> RCRA is a form of prescriptive, "cradle-to-grave" regulation which establishes strict requirements that generators of hazardous waste must meet and imposes significant penalties on those generators that fail to meet such requirements.<sup>13</sup> With very limited exceptions, the hazardous waste regulations established by EPA in Subpart C of RCRA apply uniformly to industrial facilities, academic labs, and other generators of hazardous

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5. Reinhardt, *supra* note 1, at 56.

6. *Id.* at 58.

7. *Id.* at 58–59.

8. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. 29,712 (proposed May 23, 2006) (to be codified at 40 C.F.R. pts. 261–62).

9. *Academic Labs Urge Performance-Based Approach in EPA RCRA Rule*, *supra* note 4.

10. See generally Cary Coglianese, et. al., *Performance-Based Regulation: Prospects and Limitations in Health, Safety and Environmental Protection*, 55 ADMIN. L. REV. 705 (2003).

11. EPA proposed Subpart K on May 23, 2006. On August 21, 2006, EPA extended the comment period, which subsequently ended on September 20, 2006. The final rule is expected to be released later this year.

12. Theodore L. Garrett, *An Overview of RCRA*, in THE RCRA PRACTICE MANUAL 1 (Theodore L. Garrett ed., 2d ed. 2004).

13. *Id.*

waste.<sup>14</sup>

However, given that college and university labs handle a large number of chemicals in a non-production, academic environment, such labs often fail to satisfy strict requirements for hazardous waste determinations, record-keeping, container management and labeling, and storage and removal of hazardous waste.<sup>15</sup> Under RCRA, generators must determine whether material is a hazardous waste at the point of generation, which for colleges and universities is often in a classroom or small academic lab.<sup>16</sup> Once the hazardous waste determination is made and the total amount of hazardous waste in a lab exceeds fifty-five gallons, the waste must be removed within three days.<sup>17</sup> Generators are then responsible for tracking the transportation and disposal of the waste and for obtaining from the transporter and disposal facility proper documentation that the waste was in fact disposed of.<sup>18</sup> Given the large number of chemicals that academic labs handle, and the large number of labs within any given college or university,<sup>19</sup> these requirements place tremendous burdens on academic institutions.<sup>20</sup> Most laboratory waste is disposed of in fifty-five-gallon drums, called “lab packs,” which are capable of holding about fifteen gallons of packaged waste after absorbent material is placed inside.<sup>21</sup> The cost to dispose of each lab pack varies from hundreds to thousands of dollars, depending on the type of waste.<sup>22</sup> Therefore, depending on the size and output of each college and university lab, the cost—in time and money—for academic institutions to properly dispose of hazardous waste according to the requirements of RCRA can easily reach very high levels. While using sound disposal practices and hazardous waste management recordkeeping methodologies are legitimate costs of research involving hazardous materials, the industrial facilities that incur high hazardous waste disposal costs are profit-seeking entities that are better able to absorb and redistribute these costs than are academic institutions.

Given the high cost of meeting the hazardous waste disposal requirements of RCRA, college and university labs have an incentive to work around or simply ignore the statutory requirements.<sup>23</sup> With EPA’s “frequently variable, capricious,

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14. Letter from Robert R. Rich, M.D., President, Fed’n of Am. Soc’ys for Experimental Biology, & Jordan J. Cohen, M.D., President, The Ass’n of Am. Med. Colls., to John Morrall, Adm’r, Office of Info. and Regulatory Affairs (May 16, 2002), *available at* <http://www.aamc.org/advocacy/library/research/corres/2002/051602.htm>.

15. *Id.*

16. Hogue, *supra* note 3.

17. *Id.*

18. ZYGMUNT J.B. PLATER ET AL., ENVIRONMENTAL LAW AND POLICY 859 (3d ed. 2004).

19. For example, Harvard University has approximately 1,200 labs that generate hazardous waste, 1,000 satellite hazardous waste accumulation areas, and numerous main hazardous waste accumulation areas. Letter from Joseph Griffin, Director, Env’tl. Health and Safety, Harvard Univ., to U.S. EPA (Sept. 18, 2006).

20. Hogue, *supra* note 3.

21. Corrigan, *supra* note 2.

22. *Id.*

23. PLATER, *supra* note 18, at 863.

and poorly targeted” enforcement with respect to college and university labs,<sup>24</sup> such a strategy is not surprising. Even labs that make a good faith effort to comply with RCRA may find themselves in violation of the statute. EPA enforcement is highly variable from region to region and state to state, often due to differences in interpretation depending on the inspector.<sup>25</sup> Labs found violating RCRA are subject to oftentimes capricious fines and other penalties, again depending on the individual inspector.<sup>26</sup> Therefore, institutions wishing to avoid the cost of complying with RCRA hazardous waste disposal requirements may be quite willing to take the chance that EPA will either not enforce RCRA in regard to that particular institution or that the EPA inspector will interpret the rules favorably for the institution or issue a small fine or penalty for a violation.

However, as history has proven, taking this chance can sometimes prove costly for academic institutions when EPA decides to aggressively enforce RCRA requirements. In 2004, EPA fined the Maine Community College System \$238,225 for violations, including failing to properly label containers.<sup>27</sup> In 2002, EPA fined the University of Hawaii \$505,000 for having unmarked and open containers of hazardous materials in a university storage area.<sup>28</sup> And in 2001, EPA fined the Massachusetts Institute of Technology \$150,000 for violating storage, handling, and labeling requirements.<sup>29</sup> Since 2000, EPA has fined or penalized 145 academic institutions for violating RCRA.<sup>30</sup> Many of the violations involved labeling and reporting requirements in which no environmental harm was caused.<sup>31</sup> Therefore, even if college and university labs ensure the safety of human health and the environment through methods other than those required in RCRA, the strict, prescriptive standards of RCRA impose further costs and burdens on these labs.

## II. THE DEVELOPMENT OF PERFORMANCE-BASED STANDARDS IN RCRA

While academic institutions have been petitioning EPA to change the way RCRA applies to college and university labs since at least the early 1980s,<sup>32</sup> EPA's first significant move toward modifying RCRA came in 1999 when EPA, as part of

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24. David W. Drummond, *The Role of Enforcement Policy in Changing the Regulatory Climate*, Mar. 17, 2006, <http://www2.fpm.wisc.edu/chemwasteinfo/EnforcementPolicyRoleInRegClimate.htm>.

25. *Id.*

26. *Id.*

27. Hogue, *supra* note 3.

28. *Id.*

29. *Id.*

30. *Id.*

31. *Id.*

32. In 1984, pursuant to a Congressional directive, EPA began a study of the unique challenges of hazardous waste accumulation, storage, and disposal at college and university labs. In an April 1989 Report to Congress, EPA found that academic labs generally lack an awareness of hazardous waste regulations due to the transient nature of the student population. EPA also found that academic labs generally produce highly variable wastes and lack the resources to properly manage hazardous wastes.

the national Project XL initiative to find more cost-effective approaches to environmental regulation, initiated the New England University Laboratories XL Project, a pilot program for three colleges and universities<sup>33</sup> to experiment with new regulatory approaches.<sup>34</sup> In 2001, EPA initiated another pilot program in collaboration with the Howard Hughes Medical Institute (HHMI) and ten major academic institutions, specifically designed to test performance-based standards for RCRA regulation.<sup>35</sup> The HHMI study has been a significant factor in EPA's development of Subpart K and performance-based standards for academic labs.

#### A. The Howard Hughes Medical Institute Initiative

In 2000, Congress announced its support for the HHMI initiative to develop "consensus best practices for hazardous waste management in academic research laboratories," and encouraged EPA to participate in and support the initiative.<sup>36</sup> Later that year, HHMI began its collaboration with EPA, state environmental agencies, and ten academic institutions to test a performance-based approach to the regulation of hazardous wastes in an academic environment.<sup>37</sup> The ten academic institutions, one from each EPA region, included Duke University, Harvard University, Rockefeller University, Stanford University, the University of Colorado, the University of Pennsylvania, the University of Texas, the University of Washington, the University of Wisconsin, and Washington University.<sup>38</sup> The study took place from October 2000 to October 2001, culminating in a report published by HHMI.<sup>39</sup> The institutions agreed to apply fourteen "consensus best practices" designed to provide flexibility in compliance while maintaining the safety of human health and the environment.<sup>40</sup> The consensus best practices provided broad guidelines for the institutions while allowing them to design implementation programs that best suited the unique aspects of each institution.<sup>41</sup>

The language of the consensus best practices demonstrates the initiative's commitment to broad goals rather than narrow standards. The first two consensus best practices state that the executive leadership of each institution must be committed to protecting human health and the environment and that the members of each institution's labs be responsible and accountable for implementing the institution's waste management program.<sup>42</sup> The third through eleventh consensus

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33. Those three colleges and universities were Boston College, the University of Massachusetts–Boston, and the University of Vermont.

34. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. 29,712, 29,716.

35. *Id.*

36. HOWARD HUGHES MED. INST. OFFICE OF LAB. SAFETY, REPORT ON CONSENSUS BEST PRACTICES FOR MANAGING HAZARDOUS WASTES IN ACADEMIC RESEARCH INSTITUTIONS 1–2 (2001).

37. *Id.* at 1.

38. *Id.* at 6.

39. *Id.*

40. *Id.* at 7.

41. *Id.*

42. *Id.* at 7–8.

best practices state that each institution must establish policies and procedures for pollution prevention and effective hazardous waste management.<sup>43</sup> Each institution must establish procedures for handling, containing, and storing chemicals in laboratories; make such procedures readily available to all of the members of the institution's labs; have labels with sufficient information to warn of potential health and safety standards; reduce or eliminate chemical waste wherever possible; make a proper hazardous waste determination; and plan for a response to chemical emergencies in labs.<sup>44</sup> The twelfth and thirteenth consensus best practices state that each institution must provide training that corresponds to the responsibilities of each member of the institution's labs and that a communication system must be in place to maintain awareness of the institution's waste management program throughout the institutional hierarchy.<sup>45</sup> Finally, the fourteenth consensus best practice states that each institution must conduct regular evaluations of its chemical waste management program.<sup>46</sup>

At the conclusion of the one-year trial period of these consensus best practices, HHMI found that a performance-based approach, such as the consensus best practices, was preferable to the strict, prescriptive approach currently used in RCRA.<sup>47</sup> HHMI found that the prescriptive regulatory approach, by requiring academic institutions to expend a large amount of resources meeting specific record-keeping and labeling requirements, was actually counter-productive in some instances to meeting the goal of protecting human health and the environment by diverting resources from waste minimization and other environmental stewardship activities.<sup>48</sup> HHMI stated in its Report on Consensus Best Practices that a performance-based regulatory approach for academic labs "could improve RCRA effectiveness and compliance in universities, and become a catalyst to bring about commitment and action for promoting stewardship and responsibility for health, safety, and environment" by providing incentives for academic institutions to find the most cost-effective manner to satisfy hazardous waste regulations.<sup>49</sup> HHMI urged EPA to adopt such an approach, based on the consensus best practices, which would achieve RCRA compliance while allowing flexibility for academic institutions.<sup>50</sup>

In its March 2002 report to Congress evaluating the HHMI initiative, EPA stated its unequivocal support for the development of consensus best practices.<sup>51</sup>

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43. *Id.* at 8–10.

44. *Id.*

45. *Id.* at 10–11.

46. *Id.* at 11.

47. *Id.* at 30.

48. *Id.*

49. *Id.*

50. *Id.*

51. OFFICE OF SOLID WASTE, U.S. EPA, REPORT TO CONGRESS: EVALUATING THE CONSENSUS BEST PRACTICES DEVELOPED THROUGH THE HOWARD HUGHES MEDICAL INSTITUTE'S COLLABORATIVE HAZARDOUS WASTE MANAGEMENT DEMONSTRATION PROJECT AND THE NEED FOR REGULATORY CHANGES TO CARRY OUT PROJECT RECOMMENDATIONS 9 (2002).

EPA recognized that academic research institutions have difficulty complying with current RCRA regulations and found the consensus best practices to be a sufficient alternative for protecting human health and the environment.<sup>52</sup> EPA was particularly pleased with the fact that the consensus best practices “encourage academic research institutions to develop thoughtful approaches to managing their hazardous waste.”<sup>53</sup> EPA concluded that a regulatory change would be best to institute performance-based standards in RCRA, rather than working within the constraints of the current statute, and sought to allow “the consideration of diverse viewpoints through the regulatory development and notice and comment processes.”<sup>54</sup> In addition, EPA stated that a new regulation would promote more consistency and acceptance than simply issuing agency guidance.<sup>55</sup> In concluding, EPA reaffirmed its commitment to “developing regulatory reforms that endorse best management practices and other sound alternative approaches to achieving RCRA compliance.”<sup>56</sup> Thus, the development of Subpart K and performance-based standards for academic labs began.

EPA established a three-phase approach to address the findings of the HHMI initiative.<sup>57</sup> Phase one, in June 2003, focused on gathering information from colleges and universities to determine the extent to which academic institutions were experiencing difficulty under current regulations.<sup>58</sup> Phase two, in March 2004, included guidance memoranda issued by EPA to clarify issues raised by institutions during the information-gathering process.<sup>59</sup> Subpart K is part of phase three, intended to remedy those issues that could not be addressed by guidance memoranda alone and to provide flexibility through performance-based standards.<sup>60</sup>

#### B. Performance-Based Standards in Other Federal Regulations

Two federal agencies, the Nuclear Regulatory Commission (NRC) and the Occupational Safety and Health Administration (OSHA), currently include performance-based standards in some regulations. NRC has experienced widespread success in encouraging academic institutions to comply with its regulations by focusing on the end result, such as the protection of human health and the environment, rather than the process involved in reaching the result.<sup>61</sup> Such a performance-based approach was adopted by NRC in the early 1990s and

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52. *Id.*

53. *Id.* at 10.

54. *Id.* at 11.

55. *Id.*

56. *Id.* at 11.

57. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. 29,712, 29,716.

58. *Id.*

59. *Id.*

60. *Id.*

61. Drummond, *supra* note 24.

has been upheld and reaffirmed in current enforcement policies.<sup>62</sup>

OSHA has also implemented a performance-based approach for the regulation of labs.<sup>63</sup> Central to OSHA's performance-based standards is the requirement that labs establish a Chemical Hygiene Plan, similar to the laboratory management plan required in the HHMI consensus best practices approach.<sup>64</sup> OSHA has established broad guidelines that labs must adhere to; however, the manner of compliance is largely left to the discretion of the labs.<sup>65</sup> Such guidelines assure the protection of human health and the environment while allowing labs flexibility in achieving compliance. OSHA has "discovered that a broad approach works better than a narrow one."<sup>66</sup> OSHA has found that performance-based standards provide a practical framework which allows regulated parties the opportunity to find the best approach to meet such standards and address problems.<sup>67</sup> As a result of the imposition of performance-based standards in some areas of OSHA regulation, regulated entities have taken a more systematic approach to addressing broader health and safety concerns in the workplace.<sup>68</sup> An important element of the performance-based standards approach is the creation of a culture of health and safety by giving regulated entities more control over the manner in which standards are met.<sup>69</sup> By allowing companies to satisfy regulations in the most efficient and cost-effective manner, OSHA performance-based standards have maintained or improved health and safety standards while reducing costs and burdens for regulated parties. Accordingly, the general trend in OSHA regulations seems toward broad, flexible, performance-based standards rather than narrow, inflexible, prescriptive standards.

The success and continued use of performance-based standards by both NRC and OSHA demonstrates that EPA could achieve the same or better results while simultaneously easing the burden on academic institutions by moving to performance-based standards in RCRA. In fact, such standards have served as a template for EPA's development of Subpart K.

### III. SUBPART K AND PERFORMANCE-BASED STANDARDS FOR ACADEMIC LABS

Subpart K, proposed by EPA in May 2006, modifies RCRA standards for academic labs in seven primary areas: (a) container management and labeling; (b) training of laboratory employees; (c) hazardous waste determination; (d) removal time; (e) laboratory cleanouts; (f) recordkeeping; and (g) laboratory management

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62. *Id.*

63. 29 C.F.R. § 1910.1450 (2006).

64. *Id.*

65. *Id.*

66. Charles N. Jeffress, Assistant Sec'y, Occupational Safety and Health Admin., Address at the Chicago Risk Management Forum: OSHA: A View of Today and Tomorrow (Oct. 12, 1999), *available at* [http://www.osha.gov/pls/oshaweb/owadisp.show\\_document?p\\_table=SPEECHES&p\\_id=243](http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=SPEECHES&p_id=243).

67. *Id.*

68. *Id.*

69. *Id.*



plans. The intent of the proposed rule is “to establish an alternative set of generator requirements for college and university laboratories that is better suited to their specific circumstances, and promotes environmental protection and public health through safer management of laboratory hazardous wastes.”<sup>70</sup> Subpart K is optional in that colleges and universities may choose to remain subject to current regulations or to become subject to Subpart K regulations.<sup>71</sup> However, the adoption of Subpart K will not be an option for a college or university until the state in which it is located adopts Subpart K as state law.<sup>72</sup> All labs in a college or university must operate under the same set of regulations;<sup>73</sup> however, certain academic laboratories are not covered under the definition of a laboratory under Subpart K and thus are subject to current regulations regardless of whether the college or university chooses to follow the new standards.<sup>74</sup> The proposed rule only applies to those labs “within a college or university where relatively small quantities of chemicals and other substances are used on a non-production basis for teaching or research purposes.”<sup>75</sup> The proposed rule thus does not apply to private research institutions, even though their operations are similar to those of academic labs.

#### A. Container Management and Labeling

Current regulations require that containers containing hazardous materials be kept in good condition, that waste be compatible with the containers, and that containers holding hazardous waste always be closed, except when adding or removing waste.<sup>76</sup> While most college and university labs generally do not have problems satisfying the first two elements of the current container management standards, problems often arise with the requirement to keep containers closed at virtually all times. Labs often have ongoing experiments and other processes that require the frequent use of containers and claim that keeping containers closed at all times is not always practical, given the number and complexity of materials used throughout a chemical process.<sup>77</sup> The proposed container management regulations under Subpart K still require that labs keep containers in good condition and compatible with the wastes they contain; however, the new rules give more discretion to the college or university to determine the best method to prevent spills and leaks.<sup>78</sup>

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70. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. 29,712, 29,714.

71. *Id.* at 29,712.

72. *Id.* at 29,712–13. Under Section 3006 of RCRA, states are not required to adopt Subpart K. *Id.*

73. *Id.*

74. *Id.* at 29,723.

75. *Id.*

76. *Id.* at 29,729.

77. Nat'l Ass'n of Coll. & Univ. Bus. Officers, *EPA Proposes Performance-Based Standards for Academic Labs*, NACUBO BULL., May 31, 2006, available at <http://www.nacubo.org/x8097.xml>.

78. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards

Regarding container labeling, the current standards require that containers containing hazardous waste be marked with the words “hazardous waste” or with other such words that identify the contents of the container, and that the label contain the generator’s name and address and the manifest document number.<sup>79</sup> Given the small size of the containers academic labs generally handle, many labs have experienced difficulty in fitting all of the required information on containers.<sup>80</sup> The proposed rule requires that generators label hazardous materials containers with the words “unwanted material” and with sufficient information to alert emergency personnel and transporters of the contents.<sup>81</sup> Labs are free to determine what information will be sufficient for such purpose.<sup>82</sup> Additionally, unlike under current regulations, labs may use systems, such as barcodes, that associate information with each container, thus eliminating the problem of fitting a large amount of information on a small container.<sup>83</sup>

### B. Training and Instruction

Current regulations do not contain requirements for training laboratory employees or instructing students. As a result, individuals making hazardous waste determinations in labs are often untrained and unqualified to make such a determination, resulting in improper handling of hazardous wastes, the inclusion of non-hazardous wastes in hazardous waste disposal processes, and increased costs both monetarily and environmentally.<sup>84</sup> The proposed rule attempts to remedy this problem by requiring that college and university labs provide training for lab workers commensurate with their duties and instruction for students relevant to their activities in the lab.<sup>85</sup> Academic institutions are given great deference to determine the appropriate type and amount of training and instruction.

### C. Hazardous Waste Determination

Presently, generators must make a hazardous waste determination<sup>86</sup> at the point of generation.<sup>87</sup> Any one college or university may have hundreds or thousands of

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Applicable to Academic Laboratories, 71 Fed. Reg. at 29,729.

79. Garrett, *supra* note 12, at 73.

80. Nat’l Ass’n of Coll. & Univ. Bus. Officers, *supra* note 77.

81. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,729.

82. Nat’l Ass’n of Coll. and Univ. Bus. Officers, *supra* note 77.

83. *Id.*

84. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,714.

85. *Id.* at 29,730.

86. The hazardous waste determination generally includes four elements: (a) whether the material is a solid waste as defined in 40 C.F.R. § 261.2, (b) whether the material is subject to a hazardous waste exclusion under 40 C.F.R. § 261.4, (c) whether the material is or contains a hazardous waste listed in 40 C.F.R. § 261(d), and (d) whether the material is ignitable, corrosive, reactive, or toxic as defined in 40 C.F.R. § 261(c). *Id.* at 29,721.

87. *Id.* at 29,714.

labs or chemical hoods on campus, all of which may be considered points of generation.<sup>88</sup> It is thus difficult for academic institutions to assure that a properly-trained individual is present at each point of generation to make the hazardous waste determination.<sup>89</sup>

The proposed rule provides flexibility for academic labs by allowing the hazardous waste determination to be made in the lab before the materials are removed or at an on-site central accumulation area or on-site treatment, storage, or disposal facility within four days of arrival.<sup>90</sup> The hazardous waste determination must be made by a RCRA-trained individual; however, there is no requirement that the individual generating the material in the lab be familiar with RCRA hazardous waste regulations.<sup>91</sup> The proposed rule assures that the hazardous waste determination is made by a properly-trained individual, while allowing academic institutions the flexibility to make the determination in the most convenient and cost-effective manner. The accumulation of wastes in a central on-campus area also encourages the redistribution of unwanted chemicals, thus reducing the amount of hazardous waste produced by an academic institution.<sup>92</sup>

#### D. Removal Time

One major provision of the proposed rule that is absent from current regulation is a maximum accumulation time for hazardous waste. While the current rule requires that hazardous waste be removed from a lab whenever fifty-five gallons or more of hazardous waste or one quart or more of reactive acutely hazardous waste accumulates,<sup>93</sup> the proposed rule also adds a six-month time limit for removal after the waste has been produced.<sup>94</sup> In addition, the proposed rule expands the amount of time that labs have to remove the waste after passing the fifty-five-gallon, one-quart, or six-month threshold from three calendar days, as required under the current regulations, to ten calendar days.<sup>95</sup>

The problem with the current removal time regulations is twofold. First, given that academic labs rarely accumulate fifty-five gallons of hazardous waste, the current regulations encourage labs to keep waste for long periods of time, thereby increasing the risk of container deterioration and leakage. Second, the requirement that hazardous waste be removed from labs within three days after reaching the fifty-five-gallon or one-quart threshold creates difficulties for academic institutions, as they are often unable to arrange for removal within such a short period of time.<sup>96</sup> The proposed rule remedies both problems by creating a dual

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88. *Id.*

89. *Id.*

90. *Id.* at 29,734.

91. *Id.* at 29,728.

92. Nat'l Ass'n of Coll. & Univ. Bus. Officers, *supra* note 77.

93. Reactive acutely hazardous wastes are listed in 40 C.F.R. § 261.33(e).

94. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,732–33.

95. *Id.*

96. *Id.* at 29,733.

threshold for the removal of hazardous materials. Even if a lab has not generated fifty-five gallons of hazardous waste or one quart of reactive acutely hazardous waste within a six-month period, it is still required to remove all hazardous waste present within the lab or central accumulation area.<sup>97</sup> While this requirement increases the burden on academic institutions to arrange for more frequent removal of hazardous waste, it encourages colleges and universities to establish a regular removal schedule in order to prevent stockpiling of hazardous wastes. Additionally, by extending the removal time period from three calendar days to ten calendar days, the proposed rule allows academic institutions more flexibility to arrange for removal in a convenient and cost-effective manner.

#### E. Laboratory Cleanouts

An exception to the removal provisions of the proposed rule involves laboratory cleanouts, defined by EPA as “an evaluation of the inventory of chemicals and other materials in a laboratory that are no longer needed or have expired and the subsequent removal of those chemicals or other unwanted materials from the laboratory.”<sup>98</sup> Cleanouts often occur when a professor leaves an institution or when a large research project ends and involve the removal of any unused chemicals and other hazardous materials.<sup>99</sup> Two problems arise for academic labs in relation to cleanouts under current regulations. First, given the requirement that labs remove hazardous waste within three days after accumulating fifty-five gallons or more, it is difficult and costly for labs to conduct lengthy cleanouts, since multiple pickups of hazardous waste may be required.<sup>100</sup> Second, because cleanouts involve the removal of larger amounts of hazardous waste than are produced by academic institutions in a typical month, the institution may be considered a large-quantity generator during the month of the cleanout, thus subjecting the institution to different standards.<sup>101</sup> While small-quantity generators, which produce between 100 and 1000 kilograms of hazardous waste per month, can accumulate waste on-site for up to 180 days without a permit, large-quantity generators, which produce more than 1000 kilograms of hazardous waste per month, can accumulate waste on-site for only ninety days without a permit.<sup>102</sup> Large-quantity generators must also submit a biennial hazardous waste report to EPA.<sup>103</sup> Conditionally-exempt small-quantity generators, which produce less than 100 kilograms of hazardous waste per month, are subject to very limited waste management standards and need not comply with accumulation, storage,

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97. *Id.*

98. *Id.* at 29,724.

99. *Id.* at 29,718.

100. Nat'l Ass'n of Coll. & Univ. Bus. Officers, *supra* note 77.

101. *Id.*

102. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,720.

103. U.S. EPA, LABS RULE Q AND A (May 15, 2006), <http://www.epa.gov/epaoswer/osw/specials/labwaste/lab-q-a.pdf>.

recordkeeping, or reporting requirements.<sup>104</sup> As a result, cleanouts can temporarily subject academic institutions to a different level of regulation, imposing stricter storage time limits and greater recordkeeping and reporting requirements.

Subpart K attempts to remedy these problems by excluding one cleanout per year for each lab from the determination of an institution's generator status.<sup>105</sup> Therefore, colleges and universities that are normally small-quantity generators will not be made large-quantity generators due to a Subpart K laboratory cleanout. In addition, during the Subpart K laboratory cleanout, the removal time is extended from ten calendar days to thirty calendar days in order to reduce the number of hazardous waste shipments a college or university must make.<sup>106</sup> While labs can perform an unlimited number of lab cleanouts during the year, only one such cleanout will be excluded under Subpart K during each one-year period.<sup>107</sup> Any wastes determined to be hazardous prior to the beginning of the cleanout period must be counted toward the institution's generator status.<sup>108</sup> The proposed rule eases burdens on academic institutions by preventing a temporary change in generator status due to a lab cleanout and by extending the amount of time institutions have to remove waste accumulated during a lab cleanout.

#### F. Recordkeeping

The proposed rule is intended to reduce or minimize the burden on colleges and universities in terms of recordkeeping requirements.<sup>109</sup> While academic labs are currently required to keep certain records depending on their generator status, those institutions choosing to follow Subpart K standards would need to maintain additional records including a notification to EPA of the institution's participation in Subpart K, a Laboratory Management Plan, training records for lab workers, and documentation of any lab cleanouts conducted.<sup>110</sup> While this requirement may increase the burden on some colleges and universities to develop new recordkeeping systems, most colleges and universities already have Chemical Hygiene Plans in place, as required by OSHA, which can easily be revised to meet the requirements of Subpart K.<sup>111</sup>

#### G. Laboratory Management Plan

The requirement that each academic institution participating in Subpart K create a laboratory management plan is perhaps the most important aspect of the

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104. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,720. The proposed regulations do not apply to conditionally-exempt small-quantity generators, and thus they will remain subject to current regulations, absent further regulatory amendments. *Id.* at 29,722.

105. *Id.* at 29,737–38.

106. *Id.*

107. *Id.* at 29,738.

108. *Id.*

109. *Id.* at 29,741.

110. *Id.*

111. *Id.*

proposed rule. EPA intends that the laboratory management plan and its formation process will “improve a college or university’s coordination and integration of hazardous waste management procedures and enhance environmental awareness among researchers and students at colleges and universities, leading to a transfer of good environmental management practices to the larger community.”<sup>112</sup> The laboratory management plan is thus a mechanism for implementing the performance-based standards set forth in the proposed rule by specifying the steps that the college or university will take to meet the goals of Subpart K.<sup>113</sup>

The laboratory management plan must describe the college or university’s methods for (a) removing hazardous wastes from laboratories; (b) managing and labeling containers; (c) instructing students and training lab workers; (d) ensuring the safe transportation of hazardous wastes to on-site accumulation areas; (e) preparing and responding to emergencies; and (f) conducting lab cleanouts.<sup>114</sup> While the laboratory management plan is a mandatory requirement for all academic institutions choosing to follow Subpart K, EPA has not decided whether to make the provisions of the laboratory management plan enforceable.<sup>115</sup>

According to EPA, the laboratory management plan is intended to encourage academic institutions to address their waste management programs more broadly.<sup>116</sup> EPA particularly intends that colleges and universities streamline their waste management systems to reduce waste and prevent pollution.<sup>117</sup> Accordingly, as part of the proposed rule, EPA encourages, but does not require, academic institutions to implement an environmental management system<sup>118</sup> to better assess and manage the institution’s environmental impacts.<sup>119</sup>

#### H. The Overall Benefits of Subpart K

EPA estimates that colleges and universities that choose to adopt Subpart K will realize an aggregate cost savings of one-half to three million dollars per year compared to the costs of meeting current hazardous waste disposal requirements.<sup>120</sup> Most of the estimated savings will come in the form of more efficient waste disposal and waste minimization efforts.<sup>121</sup> EPA also estimates that

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112. U.S. EPA, *supra* note 103.

113. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,739.

114. *Id.*

115. *Id.* at 29,752.

116. *Id.* at 29,739.

117. *Id.* at 29,715.

118. An environmental management system is a system of management practices and related documentation, procedures, and work practices that is put in place to manage an institution’s overall environmental impacts. *Id.* An environmental management system thus covers a much broader range of areas than a laboratory management plan.

119. *Id.*

120. *Id.* at 29,745.

121. *Id.* For example, the performance-based standards used in the HHMI study resulted in a reduction of disposal costs at the University of Washington by over sixty percent. HOWARD HUGHES MED. INST. OFFICE OF LAB. SAFETY, *supra* note 36, at 17.

the adoption of the proposed rule will result in greater safety in laboratory environments,<sup>122</sup> less exposure of humans and the environment to hazardous substances, and an overall reduction in hazardous waste.<sup>123</sup>

#### IV. EVALUATING SUBPART K

Colleges, universities, and other academic organizations are generally supportive of Subpart K. The American Council on Education (ACE), the Campus Safety, Health and Environmental Management Association (CSHEMA), and the National Association of College and University Business Officers (NACUBO), in addition to dozens of academic institutions and other interested parties, have submitted comments supporting the proposed regulations and encouraging the further implementation of performance-based standards in RCRA.<sup>124</sup> According to one ACE official, academic organizations have been trying to convince EPA for twenty years of the need to revise hazardous waste disposal regulations to accommodate the unique nature of academic labs, and the proposed rule makes such accommodations quite effectively.<sup>125</sup> However, support for Subpart K has not been uniform, and opposition to the proposed rule, in whole or in part, has been expressed by a number of interested parties.

##### A. The Scope of Coverage

The primary area of contention has been EPA's definition of a laboratory in Subpart K. The proposed rule only applies to those labs "within a college or university where relatively small quantities of chemicals and other substances are used on a non-production basis for teaching or research purposes."<sup>126</sup> The exclusion of college and university hospitals has upset medical schools and academic institutions with medical research facilities. The primary problem is that research faculty often operate out of labs located within college and university-

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122. The performance-based standards used in the HHMI study at Stanford University resulted in a fifty-five percent increase in the knowledge of hazardous characteristics and a sixty-seven percent increase in the knowledge of handling procedures by lab workers. HOWARD HUGHES MED. INST. OFFICE OF LAB. SAFETY, *supra* note 36, at 13.

123. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,745.

124. Am. Council on Educ., *ACE Supports Changes to EPA Policy Regarding Academic Lab Waste Disposal*, Aug. 15, 2006, <http://www.acenet.edu/AM/Template.cfm?Section=Home&TEMPLATE=/CM/ContentDisplay.cfm&CONTENTID=17811>.

125. *Id.*

126. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,723. Therefore, labs that are associated with an academic institution but nonetheless located outside of the college or university campus, such as hospitals, and labs located on the college or university campus but nonetheless used for a purpose other than teaching or research, such as photo processing labs, are not considered laboratories under the proposed rule. *Id.* Furthermore, the proposed rule does not apply to research institutions which are independent from a college or university. *Id.*

affiliated hospitals.<sup>127</sup> EPA's rationale for excluding hospital laboratories is that the types and amounts of waste generated in academic labs differ from those generated in hospital labs.<sup>128</sup>

While this is true to some extent, this rationale does not support a complete exclusion of hospital labs from Subpart K. Instead, the rule should include all research labs associated with a college or university, regardless of whether the lab is located in a university-affiliated hospital. To do otherwise would be to create different standards for very similar research labs within an academic institution. Under the language of the proposed rule, it is possible that a research professor could be subject to Subpart K hazardous waste regulations in his research lab in a university classroom building, and Subpart C hazardous waste regulations in his research lab in a university hospital. Such arbitrary, dual standards would create confusion for research faculty and increase the costs and inefficiencies of hazardous waste disposal. However, Subpart K should not be expanded to include university-affiliated hospital labs the main purpose of which is not teaching or research. Instead, a slight modification to include research labs at university-affiliated hospitals is appropriate. This modification will assure that large streams of biomedical waste are still regulated by current RCRA regulations, thus satisfying health and safety concerns, while allowing research labs within hospitals to operate under the same regulations as other research labs within a university. Such a position is supported by the Association of American Medical Colleges,<sup>129</sup> the American Council on Education,<sup>130</sup> the National Association of College and University Business Officers,<sup>131</sup> Harvard University,<sup>132</sup> and Stanford University,<sup>133</sup> among others. However, some would argue for an even broader definition to cover all laboratories affiliated with a college or university, such as photo labs, regardless of the research or non-research purpose of the lab.

Another problem with the definition of a laboratory in Subpart K is the exclusion of those research facilities not affiliated with a college or university, even though independent research institutions generate similar types and quantities of hazardous waste as academic institutions.<sup>134</sup> Part of the EPA definition of a laboratory in Subpart K is the requirement that the lab be located within a college

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127. Letter from Darrell G. Kirch, M.D., President, Ass'n of Am. Med. Colls., to U.S. EPA (Sept. 20, 2006).

128. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,723.

129. Kirch, *supra* note 127.

130. Letter from Sheldon E. Steinbach, Vice President & Gen. Counsel, Am. Council on Educ., & John Walda, President, Nat'l Ass'n of Coll. & Univ. Bus. Officers, to U.S. EPA (Aug. 18, 2006).

131. *Id.*

132. Griffin, *supra* note 19.

133. Letter from Lawrence M. Gibbs, Assoc. Vice Provost for Env'tl. Health & Safety, Stanford Univ., to U.S. EPA (Sept. 14, 2006).

134. Letter from Scott E. Merkle, Chief, Health and Safety Branch, Nat'l Inst. of Env'tl. Health Scis., to U.S. EPA (Aug. 16, 2006).



or university.<sup>135</sup> EPA has not cited health and safety concerns or any other rationale for such a requirement, and thus the distinction between academic and non-academic institutions seems arbitrary. Non-academic laboratories face the same challenges as academic laboratories in meeting the conditions of current hazardous waste regulations.<sup>136</sup> Furthermore, research faculty at academic institutions often work closely with research personnel at non-academic institutions, and some individuals work in both academic and non-academic labs.<sup>137</sup> As with the distinction between university labs and university-affiliated hospitals, such arbitrary, dual standards would create confusion for research personnel and increase the costs and inefficiencies of hazardous waste disposal. In addition, given that most research personnel at non-academic institutions receive their initial training and experience at academic institutions, independent labs would find it necessary to train employees to comply with a different set of hazardous waste requirements.<sup>138</sup> Thus, the costs and burdens of RCRA compliance for independent labs would be further increased. Therefore, the definition of a laboratory in Subpart K should be expanded to include independent research facilities operating under similar circumstances as academic research facilities. Such a position is supported by the American Chemical Society<sup>139</sup> and the National Institute of Environmental Health Sciences, a part of the National Institutes of Health.<sup>140</sup>

#### B. Weighing the Costs and the Benefits

One major complaint from academic institutions and state environmental agencies about Subpart K is the increased cost of compliance under the proposed regulations. Some parties have argued that requirements for hazardous waste removal and container labeling under Subpart K actually impose greater costs and burdens on academic institutions than current regulations.<sup>141</sup> However, such concerns are unwarranted given that the cost savings under Subpart K, in addition to the benefits to human health and the environment, likely outweigh the additional costs imposed.<sup>142</sup>

The central problem some academic institutions and state agencies have with Subpart K's provisions for hazardous waste removal and container labeling is that the provisions are not performance-based standards, but instead are strict,

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135. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. 29,712, 29,723.

136. Letter from Charles P. Casey, President, Am. Chem. Soc'y, to Matthew Hale, Dir., Office of Solid Waste, U.S. EPA (Oct. 26, 2004), available at [http://membership.acs.org/c/ccs/pubs/white\\_papers/0410\\_laboratory\\_regulation.pdf](http://membership.acs.org/c/ccs/pubs/white_papers/0410_laboratory_regulation.pdf).

137. *Id.*

138. *Id.*

139. *Id.*

140. Merkle, *supra* note 134.

141. See Griffin, *supra* note 19; Letter from Elizabeth W. Cannon, Chief, Hazardous Waste Section, N.C. Dep't of Env't & Natural Regs., to U.S. EPA (Sept. 20, 2006).

142. See *supra* Part III.H; see generally HOWARD HUGHES MED. INST. OFFICE OF LAB. SAFETY, *supra* note 36.

prescriptive standards, contrary to the stated purpose of Subpart K.<sup>143</sup> While this is true to some extent, this fact does not degrade the value of Subpart K or necessitate the revision of these provisions. Instead, the stricter standards in these provisions are necessary to assure the protection of human health and the environment while relaxing standards in other provisions. In addition, the fact that the standards of Subpart K are in some ways stricter and in other ways less strict than current standards is evidence that the new standards are better tailored to the particular research lab context.

In terms of the removal of hazardous wastes from academic labs and other facilities, the current rule requires that hazardous waste be removed from a lab whenever fifty-five gallons or more of hazardous waste or one quart or more of reactive acutely hazardous waste accumulates.<sup>144</sup> The proposed rule maintains the fifty-five-gallon and one-quart provisions and also adds a six-month time limit for removal after the waste has been produced.<sup>145</sup> In its comments on the proposed rule, Harvard University argues that the new removal provisions would “result in increased waste volume and disposal cost associated with removal of partially-filled containers, in conflict with the waste minimization goals of RCRA.”<sup>146</sup> Harvard advocates the revision of the removal provisions to include performance-based standards that would allow colleges and universities flexibility to remove wastes at their own discretion.<sup>147</sup>

However, such a move is unnecessary and in fact contrary to the goals of Subpart K. Requiring labs to regularly remove hazardous waste from labs does not impose a significant burden on academic institutions. The six-month time limit requires colleges and universities to remove wastes twice per calendar year. While this frequency requirement is more often than most institutions remove wastes under current regulations, the costs and burdens of scheduling two removals per year are not likely to be significant. In addition, the benefits to human health and the environment are significantly greater than any increased costs. Requiring labs to regularly remove wastes prevents the buildup of potentially-reactive hazardous materials. The intent of Subpart K is, in part, to promote “environmental protection and public health through safer management of laboratory hazardous wastes.”<sup>148</sup> Eliminating the six-month removal requirement would run contrary to this intent by encouraging labs to exercise lax removal policies that place cost savings ahead of health and safety. Therefore, the benefits of the proposed removal provisions very likely outweigh the greater burdens and costs placed on generators.

In terms of labeling requirements, the proposed rule requires that generators

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143. See, e.g., Gibbs, *supra* note 133; Griffin, *supra* note 19; Cannon, *supra* note 141.

144. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. 29,712, 29,732.

145. *Id.* at 29,733.

146. Griffin, *supra* note 19.

147. See *id.*

148. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,714.

label hazardous materials containers with the words “unwanted material” and with sufficient information to alert emergency personnel and transporters of the contents.<sup>149</sup> Labs are free to determine what information will be sufficient for such purpose.<sup>150</sup> The date the hazardous waste began accumulating and sufficient information to allow for a proper hazardous waste determination must also be associated with the container in some way, such as with a barcode.<sup>151</sup> Some comments submitted to EPA argue that the new labeling requirements are unnecessary and will create confusion.<sup>152</sup> However, these commentators seem to misread the proposed labeling regulations. By requiring that labels include certain information, and by giving labs the flexibility to determine what information is appropriate and to use referencing identification such as barcodes, EPA has struck a proper balance between a prescriptive standard and a performance-based standard. Creating greater flexibility in labeling standards would create difficulties for lab inspectors and emergency personnel when determining the contents and age of a hazardous material. By maintaining certain base standards while allowing for some flexibility in the specific language of the labels, Subpart K assures the health and safety of humans and the environment while minimizing the burden on generators.

### C. Potential Loopholes and Areas of Abuse

Two major potential problems with Subpart K are the enforceability of laboratory management plans and the exclusion of hazardous wastes generated during lab cleanouts from counting toward the lab’s generator status.

EPA’s proposed rule offers two options for the laboratory management plan. Under the first option, an academic institution must develop, implement, and retain a laboratory management plan; however, there is no requirement that the institution comply with the specific provisions of the plan.<sup>153</sup> Under the second option, an academic institution must similarly develop, implement, and retain a laboratory management plan, and the institution must comply with the specific provisions of the plan.<sup>154</sup> At this time, EPA has not decided which option to employ in the final rule, and has requested comments on this subject from interested parties.<sup>155</sup> The majority of comments submitted to EPA support the first option, making the specific provisions of the laboratory management unenforceable, thus allowing colleges and universities the flexibility to change practices as necessary.<sup>156</sup> However, such an approach is ill-advised.

By requiring academic institutions to create a laboratory management plan,

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149. *Id.* at 29,729.

150. Nat’l Ass’n of Coll. & Univ. Bus. Officers, *supra* note 77.

151. *Id.*

152. *See, e.g.*, Griffin, *supra* note 19; Cannon, *supra* note 141.

153. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,752.

154. *Id.*

155. *Id.* at 29,739.

156. Merkle, *supra* note 134.

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EPA is encouraging them to evaluate laboratory conditions on a system-wide level and create cost-effective hazardous waste solutions while simultaneously protecting human health and the environment. Allowing institutions the freedom to develop a laboratory management plan grants them a tremendous amount of flexibility to find the best approach to hazardous waste problems based on the unique characteristics of the institution. As long as the laboratory management plan addresses the six elements provided in the proposed rule,<sup>157</sup> the plan will be acceptable. However, unless the provisions of the plan are enforceable, the plan becomes meaningless, and EPA is left with less control over hazardous waste at academic institutions. In developing a laboratory management plan, colleges and universities have great liberty to draft reasonable and attainable provisions. Once an institution has committed to managing its hazardous waste in a certain manner, it should be held to such provisions. Allowing labs to stray from the provisions of the laboratory management plan would create inconsistencies throughout campus labs and disrupt the systematic nature of the laboratory management plan which EPA intended. Furthermore, state agencies would be faced with a regulatory nightmare if each lab within an institution had a way of managing hazardous waste different from that specified in the laboratory management plan.

The regulations for OSHA's Chemical Hygiene Plan support the notion that specific provisions of the laboratory management plan must be enforceable. OSHA requires that "the employer shall develop *and carry out* the provisions of a written Chemical Hygiene Plan."<sup>158</sup> Thus, according to OSHA, it is not sufficient for an employer to simply develop a Chemical Hygiene Plan in accordance with OSHA regulations. Instead, the employer must carry out the provisions of the plan in order to be in compliance with the regulations. The Chemical Hygiene Plan approach of OSHA has worked well in laboratories for fifteen years and, when coordinated with the laboratory management plan approach of RCRA, should be even more beneficial.<sup>159</sup> In order to preserve the original intent of Subpart K and the laboratory management plan, maintain consistency and uniformity within each academic institution, and ease the regulatory burden on state agencies, the specific provisions of the laboratory management plan must be enforceable.

In addition to the enforceability of the laboratory management plan, another potential problem in the proposed rule is the exclusion of hazardous wastes generated during a Subpart K cleanout period from counting toward the institution's generator status. Such an exemption runs contrary to the purpose of RCRA to protect human health and the environment, as well as the purpose of Subpart K to minimize the production of hazardous wastes.

By allowing academic institutions to exclude a significant amount of waste generated each year, the exemption discourages waste minimization by allowing labs to remain subject to small-generator requirements, when in actuality the labs should be subject to large-generator requirements. The problem many academic

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157. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. at 29,752.

158. 29 C.F.R. § 1910.1450(e)(1) (2006) (emphasis added).

159. Steinbach & Walda, *supra* note 130.

institutions currently have with cleanouts is that they can be temporarily subject to a different level of regulation, imposing stricter storage time limits and greater recordkeeping and reporting requirements.<sup>160</sup> However, such additional burdens do not justify a cleanout exemption in the hazardous waste regulations.

Whenever a generator produces the threshold amount of hazardous waste per month, regardless of the reason for such production, the generator should be subject to the appropriate generator status and requirements. Thus, every generator that produces between 100 and 1000 kilograms of hazardous waste per month should be subject to small-generator requirements and every generator that produces over 1000 kilograms should be subject to large-generator requirements.

Given the risks and dangers involved with handling large amounts of hazardous waste, EPA has placed appropriate safeguards and stricter requirements in the regulations for generators of larger quantities of waste. The fact that waste is generated during a cleanout period does not degrade the risks and dangers of handling large quantities of hazardous waste. Furthermore, under the proposed rule, in addition to exempting wastes from being counted towards the institution's generator status, the cleanout exemption would also exempt such waste from being reported on the institution's biennial report used by state agencies to collect hazardous waste data.<sup>161</sup> The exemption of such data will inhibit the ability of state agencies to accurately track and control the amount of hazardous waste disposed of within the state, thus leading to ineffective regulation.<sup>162</sup> Therefore, in order to assure the full availability of necessary data and to properly regulate the disposal of large amounts of hazardous waste, all hazardous waste generated during a cleanout period should be counted toward an institution's generator status.

#### D. Enforcement and the Burden on State Environmental Agencies

A number of state agencies, including the Nebraska Department of Environmental Quality (NDEQ), the Idaho Department of Environmental Quality (IDEQ), and the Ohio Environmental Protection Agency, have expressed concern about the burden on state agencies under Subpart K.<sup>163</sup> NDEQ and IDEQ have even gone so far as to assert that performance-based standards should not be a part of RCRA regulations.<sup>164</sup> The central concern for agencies is that Subpart K creates dual standards within RCRA, thus placing "increased demands on regulatory enforcement staff as they must learn and apply another set of unique rules."<sup>165</sup> Given that the adoption of Subpart K in most states is dependent on action by state agencies, the increased cost of enforcement to state agencies is a valid and significant concern. By essentially requiring those states that adopt Subpart K to

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160. See *supra* Part III.E.

161. Letter from Joseph P. Koncelik, Director, Ohio EPA, to U.S. EPA (Aug. 29, 2006).

162. *Id.*

163. Letter from David B. Haldeman, Waste Div. Adm'r, Neb. Dep't of Env'tl. Quality, to U.S. EPA (Aug. 18, 2006); Letter from Brian R. Monson, Hazardous Waste Program Manager, Idaho Dep't of Env'tl. Quality, to U.S. EPA (Sept. 12, 2006); Koncelik, *supra* note 161.

164. Haldeman, *supra* note 163; Monson, *supra* note 163.

165. Koncelik, *supra* note 161.

enforce two different sets of regulations and by not offering to assist states with the costs of such additional enforcement efforts, EPA is in effect reducing the likelihood that states will adopt Subpart K.

However, the state agencies have not presented any evidence that enforcement costs after the adoption of Subpart K will be greater than current enforcement costs. Under the current, strict, prescriptive standards of RCRA, state agencies must closely monitor each step in the hazardous waste process. Meanwhile, under the proposed, flexible, performance-based standards of Subpart K, if EPA decides to make the provisions of the laboratory management plan unenforceable, state agencies will essentially only need to monitor the end result to assure that states are meeting established hazardous waste standards, and thus it is likely that the costs of enforcement for state agencies will be less than current costs. However, if EPA does make the provisions of the laboratory management plan enforceable, then states could be subject to higher enforcement costs. Without cost projections, it is difficult to be certain.

Yet even if the assertions of the state agencies are true, the benefits of Subpart K likely outweigh the increased costs of enforcement. EPA estimates that the aggregate cost savings to academic institutions under Subpart K will be one-half to three million dollars per year.<sup>166</sup> EPA also estimates that the adoption of the proposed rule will result in greater safety in laboratory environments, less exposure of humans and the environment to hazardous substances, and an overall reduction in hazardous waste.<sup>167</sup> These benefits of cost savings for academic institutions, increased health and safety, and a reduction in hazardous waste likely outweigh the costs state agencies could face after the adoption of Subpart K. Therefore, state agencies should adopt Subpart K in order to serve broader societal interests. Additionally, EPA should increase RCRA grant allocations for those states that adopt Subpart K in order to ease the potential burden of additional enforcement costs and to encourage state adoption.

Another concern of state agencies is that performance-based standards are inappropriate for hazardous waste regulation.<sup>168</sup> In a letter to EPA, NDEQ asserts that “the addition of specific regulation[s] for college lab generated waste [is] unsupported by the rationale provided in the proposed rule.”<sup>169</sup> NDEQ states that “so-called flexible approaches are essentially unenforceable in the real world. What is enforceable are clear requirements designed to be met by any generator of hazardous waste.”<sup>170</sup> In echoing these concerns, IDEQ argues that the adoption of Subpart K “may cause more time spent at inspections, record reviews, and enforcement activities.”<sup>171</sup>

However, the history of hazardous waste regulation has demonstrated that strict,

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166. Standards Applicable to Generators of Hazardous Waste; Subpart K—Standards Applicable to Academic Laboratories, 71 Fed. Reg. 29,712, 29,745.

167. *Id.*

168. Haldeman, *supra* note 163; Monson, *supra* note 163.

169. Haldeman, *supra* note 163.

170. *Id.*

171. Monson, *supra* note 163.

prescriptive standards simply do not work well in research laboratory environments. In many situations, it is impossible for academic labs to comply with standards designed for industrial settings.<sup>172</sup> While straightforward, specific requirements may be easier to enforce, the fact is that such requirements are simply not practical or applicable in all situations. Instead of writing off performance-based standards, state agencies should recognize the overall benefits of a more flexible approach and embrace such standards in hazardous waste regulation. By allowing academic labs the opportunity to find the best and most effective solutions for their hazardous waste needs, flexible standards will likely reduce enforcement costs by encouraging self-enforcement and peer review. Labs will take the initiative to reduce hazardous waste disposal costs as much as possible by reducing their waste production, thus benefiting human health and the environment by reducing the amount of hazardous material being placed into the natural world. Therefore, in order to serve the broader interests of protecting human health and the environment, state agencies should recognize the overall benefits of performance-based standards and adopt Subpart K.

#### E. Subpart K as a Template for the Overhaul of RCRA

Subpart K has the potential to serve as a template for the broader overhaul of RCRA hazardous waste regulations. By finally agreeing to performance-based standards after over twenty years of petitioning from academic organizations, EPA has set in motion a process that could revolutionize hazardous waste regulation, if not broader environmental regulation. Over the past thirty years of environmental regulation, prescriptive standards have often proven to be costly and ineffective. Strict standards simply do not work in every area. Therefore, EPA and state agencies should move forward with the implementation of Subpart K, and academic institutions should adopt Subpart K standards as soon as reasonably possible. By moving forward with the widespread use of performance-based standards in hazardous waste regulation, it can be demonstrated whether such standards prove to be less costly and more effective than prescriptive standards.

If it is the case that Subpart K proves to effectively protect human health and the environment while reducing costs and burdens for academic labs, then EPA should consider implementing performance-based standards throughout RCRA. By moving toward a more flexible approach to hazardous waste regulation, EPA will encourage ingenuity and efficiency in the implementation of hazardous waste programs. The proper approach certainly seems to be broad, flexible standards designed to assure the protection of human health and the environment while simultaneously minimizing the detriment to regulated entities. Such an approach, using Subpart K as a template, very well could be the future of environmental regulation.

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172. *Academic Labs Urge Performance-Based Approach in EPA RCRA Rule*, *supra* note 4. See *supra* Part I.

## V. DEVELOPING A CULTURE OF HAZARDOUS WASTE REDUCTION

Regardless of the regulatory system EPA chooses to adopt, academic institutions, independent laboratories, industries, and other regulated entities have a duty to serve as stewards of the environment. At all times generators should manage all hazardous materials, not only hazardous wastes in a manner that protects human health and the environment.<sup>173</sup> By allowing regulated entities to find more effective and efficient ways to protect the environmental and human health,<sup>174</sup> EPA is granting such entities a substantial amount of discretion. Thus, it is the responsibility of these entities to exercise good moral judgment in order to avoid abusing this discretion. The true test will be whether governments and regulated entities work together to adopt innovative approaches to achieve improved environmental results at a lower cost.<sup>175</sup>

The most effective way for hazardous waste generators to act as good stewards of the environment is to prevent the generation of hazardous waste at the source. With continued efforts to reduce the production of hazardous waste, it is possible to reduce, if not completely eliminate, hazardous waste pollution from future processes.<sup>176</sup> By developing pollution prevention practices within academic institutions, such practices will be passed on to future generations of researchers, engineers, and industrial workers.<sup>177</sup>

The first step in developing a culture of hazardous waste reduction in an academic institution is to centralize waste management.<sup>178</sup> By eliminating the decentralized nature inherent in academic environments, institutions can assure consistency and uniformity in hazardous waste management. Once a centralized system is in place, it is important to establish realistic, progressive goals for hazardous waste reduction, both on an institutional and departmental basis.<sup>179</sup> By setting goals and encouraging employees to meet such goals, institutions define acceptable limits for hazardous waste production and encourage employees to find ways to reduce hazardous waste production in order to meet these goals. In order to best define and meet goals, it is important to establish programs to track the sources of waste within an institution.<sup>180</sup> Tracking hazardous waste makes it easier for institutions to spot problem areas and to assure that all waste is being properly handled. Once a tracking system is in place, an institution can then establish a program for the exchange of unused hazardous materials.<sup>181</sup> A large amount of the hazardous waste generated by academic labs comes in the form of unused materials, generally left over after a project is finished or a researcher leaves.

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173. Reinhardt, *supra* note 1.

174. ALFRED A. MARCUS ET AL., REINVENTING ENVIRONMENTAL REGULATION 1 (2002).

175. *Id.*

176. OHIO EPA, RESEARCH AND EDUCATIONAL LABORATORY WASTE REDUCTION 1 (1997), available at <http://www.p2pays.org/ref/04/03852.pdf>.

177. *Id.*

178. *Id.* at 2.

179. *Id.*

180. *Id.*

181. *Id.*



Academic institutions can eliminate a large amount of hazardous waste by reusing hazardous materials in other labs within the institution. Labs can also conduct periodic audits to check for unnecessary materials that could be used by other labs.<sup>182</sup>

Another method to reduce hazardous waste production is to limit purchases of hazardous materials to only that amount which is necessary for a particular project.<sup>183</sup> Academic institutions often stockpile materials and buy in bulk in order to save on purchase costs. However, few institutions consider disposal costs when excess materials must be removed.<sup>184</sup> Disposal costs can often exceed twenty to fifty times the purchase price.<sup>185</sup> Therefore, academic institutions should consider both the costs of purchase and of disposal when buying hazardous materials. In addition, institutions should decline donated or sample chemicals from companies unless such materials are actually needed.<sup>186</sup>

Another important factor in reducing hazardous waste production is employee training.<sup>187</sup> By training employees in methods of hazardous waste reduction and by educating them about the benefits of waste minimization, academic institutions can significantly aid efforts to develop a culture of hazardous waste reduction. In addition, by using alternative methods of teaching and experimentation, such as using computer simulation, substituting less hazardous materials, reusing materials, and consolidating instruction, institutions not only reduce the present production of hazardous waste but also teach future generations methods to minimize waste production.<sup>188</sup>

The best way to manage a waste problem is to prevent waste wherever possible.<sup>189</sup> Therefore, by maintaining a commitment to hazardous waste reduction and by implementing widespread waste minimization policies, academic institutions can develop a culture of hazardous waste reduction.

#### CONCLUSION

After twenty years of petitioning from academic institutions, EPA appears to have finally developed hazardous waste regulations appropriate for the unique academic environment. While the development of performance-based standards in RCRA was a long and tedious process, the implementation of such standards through Subpart K will likely be less so. Subpart K, as proposed, is imperfect, and the recommendations herein made do not purport to achieve perfection either. However, through the implementation of performance-based standards in hazardous waste regulation, regardless of the specific details of such standards, academic labs will be better off than under current prescriptive standards. EPA is

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182. *Id.* at 3.

183. *Id.*

184. *Id.*

185. *Id.*

186. *Id.*

187. *Id.*

188. *Id.* at 4.

189. *Id.* at 5.

granting academic institutions a great deal of discretion in Subpart K,<sup>190</sup> and it is the duty of these colleges and universities to exercise such discretion in a manner that assures the protection of human health and the environment.

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190. Given this discretion, as well as the novelty of performance-based standards in academic labs, it is imperative that EPA actively monitor the program and continually evaluate its strengths and weaknesses.