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December 17, 1990

FINAL STATEMENT OF REASONS FOR

ARTICLE 5: WATER QUALITY MONITORING AND RESPONSE  
PROGRAMS FOR WASTE MANAGEMENT UNITS

OF

CHAPTER 15: DISCHARGES OF WASTE TO LAND



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## INTRODUCTION

The State Water Resources Control Board [State Board], by State Board Resolution No. 91-2, dated January 24, 1991, repealed Article 5 [Water Quality Monitoring for Classified Waste Management Units, commencing with Section 2550] of Chapter 15 [formerly Subchapter 15] of Division 3 [formerly Chapter 3] of the California Code of Regulations [23 CCR 2510 et. seq., "Chapter 15"] and replaced it with revised Article 5 [Water Quality Monitoring and Response Programs for Waste Management Units]. The revised article sets forth monitoring and response regulations that more clearly illustrate compliance with Section 13172(d) of the California Water Code which requires the State Board to adopt standards and regulations which are consistent with the Federal Hazardous Waste Management System [HWMS] regulations implementing the Federal Resource Conservation and Recovery Act [RCRA]. An additional purpose of this action is to set forth regulations which are consistent with analogous regulations proposed by the Department of Health Services [DHS] as part of their effort to receive authorization to administer a State regulatory program that is equivalent to and consistent with the HWMS mandated by RCRA. These regulations were drafted by a working group comprised of staff from both the State Board and DHS. The State Board and DHS have concurrent statutory authority to adopt regulations which are applicable to hazardous waste treatment, storage, and disposal sites; and both agencies have determined that adoption of duplicate regulations is necessary to ensure regulatory consistency at these sites.

While ensuring regulatory consistency with DHS, it is also the intent of the State Board to set forth regulations that conform to the objectives of, and are no less stringent than, the current regulations governing Discharges of Waste to Land in Chapter 15 which were adopted by the State Board in 1984 to implement the Porter-Cologne Water Quality Control Act [Div. 7 of the California Water Code, commencing with Section 13000, and hereinafter referred to as Porter-Cologne] in the context of discharges to land. One of the objectives that guided the development of existing Chapter 15 was to create regulations consistent with analogous provisions of the federal HWMS regulations as they existed in 1984. These federal provisions have been substantively modified since 1984. Therefore, it is also the intent of this amendment to ensure continued consistency with the federal regulations of Subpart F, as amended.

These regulations were drafted using three [then-existing] sets of regulations as a baseline: (1) the ground water protection requirements of the U.S. Environmental Protection Agency's [EPA] Hazardous Waste Management System regulations [40 CFR Part 264, Subparts F and M, hereinafter

referred to as Subpart F and Subpart M, respectively]; (2) the water quality monitoring requirements of Chapter 15, including those of [now-repealed] Article 5; and (3) the environmental monitoring requirements contained in Standards for Management of Hazardous and Extremely Hazardous Wastes [Article 22, Chapter 30, Division 4, Title 22 of the California Code of Regulations, "Article 22"] which has since been repealed and replaced by new Division 4.5. As such, revised Article 5 sets forth water quality monitoring and corrective action requirements for discharges of waste to land.

The purpose of revised Article 5 is to set forth regulations that are, at a minimum, consistent with and equivalent to the federally mandated regulations of Subpart F. It is also the intent of revised Article 5 to set forth regulations that maintain the site-specific water quality protection strategy set forth in existing Chapter 15. This strategy is discussed in the preamble to the Statement of Reasons for existing Chapter 15. Discharges of waste to land must be contained or restricted because the wastes, if inappropriately discharged, would pose a substantial threat to human health and the environment [including beneficial uses of waters of the State]. In most cases, wastes discharged to land for treatment, storage, and disposal require containment in order to prevent adverse effects on water quality. Chapter 15 sets forth siting and construction standards for waste management units that are appropriate for the purposes of containing wastes or otherwise preventing impairment of beneficial uses of waters of the State, as well as for protecting human health, as discussed in the preamble to the existing Chapter 15's Statement of Reasons. However, experience has shown that engineered containment structures for these units can fail [see Section 25179.2 of the Health and Safety Code], resulting in releases of wastes to the environment. In virtually all cases, once containment structures are constructed, and particularly once discharges have begun, they are not accessible for visual inspection and releases are not visible. Therefore, water quality monitoring provides the most reliable assurance that performance standards for containment of wastes are being met. It also provides a warning if performance standards or Waste Discharge Requirements are not being met. In cases where total containment is not required, water quality monitoring provides the only assurance that water quality is not being adversely effected by effluent leachate. Except where springs exist, ground water is only accessible through the use of wells or other sampling devices; therefore, monitoring provides the only means to ensure whether ground water quality is being affected or



threatened by the anticipated releases from a waste management unit that provides only partial containment.

Monitoring of the unsaturated zone directly beneath a waste management unit, and above ground water, provides the opportunity to detect releases before they reach ground water. Therefore, unsaturated zone monitoring provides the means to detect releases at the earliest possible opportunity. With this early detection, remedial measures can be implemented to arrest the migration of a release, thus preventing or minimizing the affects on the underlying ground water. Releases can have extremely adverse affects on water quality, especially when allowed to continue because they are undetected and because timely remedial action is not taken. Water quality monitoring provides the only means to identify the waste constituents which are released from a waste management unit and to delineate the existing and projected extent of the release so that an appropriate remedial response can be designed. Timely implementation of an appropriate corrective action program can prevent the loss of beneficial uses of the affected waters and can prevent extensive cleanup costs. The existing water quality monitoring regulations of Article 5 provide for the "earliest possible" detection of any release and appropriate corrective action is required as a direct response to any detected release. This approach is continued under revised Article 5.

Under revised Article 5, a three-phase monitoring and protection strategy will be applied to waste management units [i.e., Detection, Evaluation, and Corrective Action monitoring]. This monitoring strategy is adapted from repealed Article 5 of Chapter 15 and was intended to emulate the three phase approach to monitoring and corrective action in Subpart F. Monitoring under revised Article 5 is required for purposes of detecting releases from waste management units and for responding to releases with more extensive monitoring focused on determining the appropriate corrective action to be taken. The State's strategy generally parallels the federal approach under the Subpart F regulations. However, under Subpart F, corrective action is not required as a direct response to a confirmed release. The second-phase monitoring program under Subpart F [Compliance Monitoring Program] requires more extensive monitoring than under the Detection Monitoring Program; but, the Compliance Monitoring Program also provides for establishing acceptable levels of waste releases ["maximum concentration limits" and "alternative concentration limits" constitute a variance from background water quality values]. Corrective action under Subpart F is not required until "evidence of

increased contamination" is determined [i.e., when one of the acceptable levels (concentration limits) is exceeded]. The focus of the second-phase monitoring program under revised Article 5 [Evaluation Monitoring Program] is different from the focus of the federal Compliance Monitoring Program. This difference is reflected in the different program titles. The focus of evaluation monitoring under revised Article 5 is adapted from repealed Article 5 of Chapter 15, under which a waste management unit was out of compliance once a release had occurred. The main objectives are to acquire the data necessary to assess the nature, magnitude, and extent of the detected release and to design an appropriate Corrective Action Program. When these objectives are met, the discharger's Waste Discharge Requirements are amended to institute the Corrective Action Program. During the Evaluation Monitoring Program, a minimum amount of monitoring [at least semi-annual] is required to be consistent with the monitoring required under the federal Compliance Monitoring Program and to help indicate any changes in the nature or extent of the release.

Under revised Article 5, the process for selecting the waste constituents and parameters to be monitored during each program is also adapted from repealed Article 5 of Chapter 15. Two new terms are used to clarify this process. The terms identify the two different monitoring lists which are required to be established for the Waste Discharge Requirements for each unit. The goal is to allow the discharger to monitor for a relatively small number of waste constituents and indicator parameters that will provide a high degree of certainty that the data needs of each monitoring and response program will be met, rather than to require extensive monitoring for all of the known constituents of waste which are placed in the unit. The intent of this approach is to develop cost-effective monitoring and response programs that will provide reliable information about any affects upon water quality that result from the discharge of waste to land at waste management units.

The term "Constituents of Concern" is used in the revised regulations to provide a consolidated reference to the waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in a waste management unit. A list of "Constituents of Concern" must be specified as part of the Water Quality Protection Standard [Standard] which is established as the basis for monitoring ground water, surface water, and the unsaturated zone at each waste management unit. The Standard is established

to provide a direct mechanism for protecting human health and the environment [including beneficial uses of waters of the State].

The term "Monitoring Parameters" is used in the revised regulations to refer collectively to the physical parameters, waste constituents, hazardous constituents, and reaction products that will provide a reliable indication of the presence or absence of a release from a waste management unit. The list of Monitoring Parameters must be selected based upon an expected or demonstrated correlation with the known and expected waste constituents and reaction products that would be expected to be found in the surface water, ground water, or in the unsaturated zone in the event of a release from the unit [Constituents of Concern] and upon the data needs of the monitoring and response program to be implemented. The approach is to allow the discharger to propose a set of the best "indicators" of a release of the waste contained in a unit based on an analysis of the types and quantities of the wastes managed at the unit and the concentrations within those wastes. This allows the discharger to focus resources on monitoring which is based on an accurate prediction of leachate characteristics, potential leachate reactions with soil and site-specific conditions.

Dischargers must monitor for the list of Constituents of Concern periodically in order to ensure that water quality is adequately protected from the potential adverse affects of the wastes discharged at each unit. Monitoring for the Constituents of Concern provides the data necessary to determine if the list of Monitoring Parameters continues to be appropriate for site conditions and to determine whether the monitoring program continues to achieve its intended effectiveness. Dischargers are required to monitor for the list of "Monitoring Parameters" at least semi-annually in order to provide adequate water quality monitoring data for achieving the objective of each monitoring and response program. Monitoring for the entire list of Constituents of Concern is allowed on a less frequent basis than for the list of Monitoring Parameters as long as the objectives of the monitoring and response program are being met.

Under Subpart F of the federal regulations, when a Compliance Monitoring Program is implemented [once a release from a waste management unit has occurred], monitoring is required at least semi-annually for "hazardous constituents" that have been detected in ground water and that are reasonably expected to be in or derived from waste contained in the waste management unit. Also, under Subpart F, when a Corrective Action Program is implemented, monitoring is required to be conducted for these

"hazardous constituents" to determine the effectiveness of corrective action measures. The list of "Monitoring Parameters" for the each monitoring program under the revised regulations is not limited to "hazardous constituents". Depending on the type and extent of site-specific data required to achieve the objective of the Evaluation or Corrective Action Program, this list may or may not include all of the hazardous constituents that have been detected. However, at a minimum, the list of "Constituents of Concern" for evaluation and corrective action monitoring under revised Article 5 must include all "hazardous constituents" that have been detected in the ground water, surface water, or the unsaturated zone. These requirements ensure that the monitoring and response program addresses all hazardous constituents which have been released from a waste management unit in order to protect human health and the environment [including beneficial uses of waters of the State] and provides consistency with the requirements in Subpart F.

The monitoring requirements for a Corrective Action Program under revised Article 5 may be based on the evaluation monitoring requirements; however, the monitoring program must be effective in determining whether the specified clean-up levels [concentration limit] for each "Constituent of Concern" is being achieved. This allows the discharger to continue to use portions of the existing monitoring program that have been determined to be effective in evaluating water quality conditions at the unit. Termination of a corrective action program is based on concentrations of all "Constituents of Concern" being reduced below their respective concentration limits. Although normal monitoring during corrective action can be based upon the more limited suite of Monitoring Parameters, termination of the Corrective Action Program must be based upon monitoring data for each Constituent of Concern. As previously discussed, the list of Constituents of Concern is not limited to hazardous constituents as in the federal regulations. All waste in a waste management unit is subjected to the criteria for a Corrective Action Program because the goal is to restore water quality to the conditions that existed prior to any release. Corrective Action Cleanup levels which are greater than background water quality values may be established for a Corrective Action Program because total cleanup may not be feasible in all cases. In addition, this allows the California Regional Water Quality Control Boards [regional boards] to consider the economics of cleanup actions while still maintaining water quality at levels which protect human health and the environment by protecting existing and potential beneficial uses of waters of the State.

It is important to note the difference between the way Subpart F uses the terms "parameter" and "constituent" and the way these terms apply under revised Article 5. In the revised article the word "parameter" is used to refer to a "Monitoring Parameter", and the word "constituent" is used to refer only to a constituent of waste [hazardous and non-hazardous] or a known reaction product of waste contained in the unit [i.e., a "Constituent of Concern"]. In Subpart F the term "constituent" either refers to a component of hazardous waste or identifies one of the compounds in the list of "hazardous constituents" under Appendix IX of 40 CFR 261, whereas the term "parameter" refers to indicator parameters [e.g., specific conductance, total organic carbon, total organic halogen], which are used only in the federal Detection Monitoring Program to identify a release. In the Subpart F Compliance Monitoring and Corrective Action Programs, the function of the "parameter" or "indicator parameter" is replaced by the federal ground water protection standard.

The monitoring required during the Detection Monitoring Program of revised Article 5 conforms to the detection monitoring required under Subpart F; however, the basis for determining appropriate "Monitoring Parameters" is more extensive under revised Article 5 because these revised State regulations impose detection monitoring requirements that provide for the earliest possible warning of releases and impose response requirements whether or not hazardous constituents are present in a confirmed release. The parameters and constituents to be monitored for under Subpart F are selected on the basis that each will provide a reliable indication of "the presence of hazardous constituents" in ground water. The "Monitoring Parameters" for the revised Article 5 Detection Monitoring Program are required to be selected on the basis that each will provide a reliable indication of "a release from the waste management unit". This requirement is adapted from the criteria set forth in repealed Article 5 of Chapter 15.

Subpart F imposes ground water monitoring and response requirements for waste management units. The California regulations under repealed Article 5 imposed ground water, surface water, and unsaturated zone monitoring and response requirements. Monitoring of the unsaturated zone is required, to the extent that such monitoring is technically feasible, in order to provide for detecting releases at the earliest possible opportunity. To retain California's approach, revised Article 5 includes provisions directed to surface water and to soil-pore liquid in the unsaturated zone in addition to ground water. The terms "monitoring point" and "background monitoring point" are

used in revised Article 5 to refer to the monitoring locations in all monitored media [i.e., ground water, surface water, and the unsaturated zone]. Therefore, these terms are used instead of the terms "wells" or "upgradient wells", which are used in Subpart F, when the requirements pertain to monitoring locations in ground water. Also, the revised regulations pertain to any release "from a waste management unit" rather than exclusively to releases "to the uppermost aquifer" or "to ground water", as does Subpart F.

Consistent with Subpart F, revised Article 5 requires that ground water monitoring must be conducted at the "point of compliance" and the federal definition of the point of compliance has not been altered [except to extend the "vertical surface" through the uppermost aquifer]. However, the monitoring requirements in revised Article 5 [adapted from repealed Article 5] specify that monitoring points must be established that will enable the earliest possible detection of a release from a waste management unit. Therefore, monitoring points are required such that the federal point of compliance is included as a part of a more comprehensive zone of detection monitoring rather than the only point of detection. Thus, ground water monitoring points under the revised regulations are not limited to "wells at the point of compliance". For this reason, the revised regulations are written to apply at all monitoring points [including those at the point of compliance].

The phrase "for each waste management unit" has been used throughout revised Article 5 in order to clarify the requirement that each waste management unit at a treatment, storage, or disposal facility must have an individually designed monitoring program even though certain elements of the monitoring programs may apply to two or more units. This is to retain consistency with the State regulations under Chapter 15 of Title 23 which apply to individual classified waste management units.

For example, a landfill and an adjacent surface impoundment may share background monitoring points, monitoring points for surface water, and may even have a common point of compliance. The list of Constituents of Concern and the list of Monitoring Parameters for these units may, however, be significantly different. Each unit would have separate unsaturated zone monitoring points because the radius of influence of unsaturated zone monitoring devices is too small to apply to more than one unit. However, two units could share individual ground water monitoring points, so long as each such shared monitoring point was situated

appropriately to provide an indication of a release from either unit and the sampling schedule and the analyses conducted with the samples could be applied to each unit separately. If a release were detected from the surface impoundment, the discharger would be required to initiate an evaluation monitoring program for that unit. Unless the regional board or the discharger had reason to suspect that the source of contamination was actually the landfill, the discharger would not be required to initiate an evaluation monitoring program for the landfill, but would be required to continue a detection monitoring program for that unit.

The regulations in each section of revised Article 5 conform to the corresponding regulations in Subpart F except for the differences discussed in the introduction to this Statement of Reasons and the specific differences identified in the following analysis. The revised article was written such that unless reference is made to a specific class of waste management unit, the requirements are generally applicable to Class I, II, and III waste management units. Most of the requirements are of general application, because the appropriate ground water monitoring and response approach for a release is not a function of the classification of the unit, but rather a function of the fact that the release has the capability to affect human health or the environment [including beneficial uses of waters of the State].

#### INCORPORATION BY REFERENCE

The "Unified Soil Classification System", published as a three-volume set by the Bureau of Reclamation and dated January 1986, has been incorporated by reference because, with 289 pages of text, it is too long and unduly cumbersome to be included in the text of the regulations. This document is generally available from the Bureau of Reclamation, Engineering and Research Center, Attention: Code D-7923-A, P.O. Box 25007, Denver, Colorado 80225.

#### APPLICATION TO SMALL BUSINESSES

The revised regulations require regulated dischargers, including small businesses (as defined in subdivision (e) of Section 11342 of the Government Code), to submit periodic technical and monitoring reports to the various California Regional Water Quality Control Boards; application of these requirements to small businesses is necessary to protect the health, safety, and welfare of the people of the state because discharges to land by small businesses present the same threat to water quality as discharges of similar wastes by major industries or

municipalities. For example, the Solid Waste Assessment Test program has demonstrated that many small, privately-owned Class III landfills are contributing leachate to the ground water in quantities sufficient to cause degradation of beneficial uses of their underlying ground waters.

#### LOCAL MANDATE DETERMINATION

In 1979 voters enacted Proposition 4 which added Article XIII B to the Constitution of the State of California. Section 6 of Article XIII B generally requires the state to reimburse local governments and school districts for increased costs incurred by them to implement new or enhanced programs mandated by the state after January 1, 1975 (i.e., "costs mandated by the state"). The Legislature has adopted a statutory scheme to implement the reimbursement requirements of Article XIII B (Government Code 17500, et seq.). These statutory provisions include definitions that clarify the meaning of terms used in the Constitution and the implementing legislation.

Government Code 17514 defines "costs mandated by the state" in relevant part as:

"...increased costs which a local agency is required to incur after July 1, 1980 as a result of any statute enacted on or after January 1, 1975, or any executive order implementing any statute enacted on or after January 1, 1975, which mandates a new program or higher level of service in an existing program...."

Local agencies and school districts may incur increased costs as a result of these regulations. Local agencies responsible for waste management units may incur direct costs to install and operate satisfactory monitoring systems. Other local agencies and school districts may have to pay higher fees to discharge wastes at waste management units that have satisfactory monitoring programs. Nevertheless, increased costs must be associated with statutory mandates or executive orders in order to qualify for a subvention of state funding.

Government Code 17516 specifically excludes components of the state's water quality control program from the definition of the term "executive order". Accordingly, "...orders, plans, requirements, rules, or regulations of the State Water Resources Control Board or any Regional Board which are adopted pursuant to Division 7 (commencing with Section 13000 of the Water Code)" cannot provide a basis for reimbursement.



Division 7 of the Water Code (the Porter-Cologne Water Quality Control Act) provides the authority under which the State Board and the Regional Boards regulate discharges of waste to land (as well as other discharges of waste that could affect the quality of the waters of the state). Therefore, these regulations, which implement Division 7 with respect to the monitoring requirements for discharges of waste to land, are excluded from the category of "executive orders" under Government Code 17516, and cannot give rise to state liability for increased costs incurred by local agencies or school districts.

The Commission on State Mandates relied on this reasoning to reject a claim for reimbursement of costs incurred by the County of Fresno to comply with requirements contained in earlier amendments to the State Board's regulations governing discharges of waste to land. (Commission on State Mandates, Decision No. CSM-4212, September 25, 1986.)

Furthermore, in County of Los Angeles v. State of California (1987) 43 Cal 3d 46, 233 Cal Rptr 38, the State Supreme Court held that reimbursement under Section 6 of Article XIII B is available only for the cost of "...programs that carry out the governmental function of providing services to the public, or laws which, to implement a state policy impose unique requirements on local governments and do not apply generally to all residents and entities in the state...."

These regulations, and all other regulations in Chapter 15, are applicable generally to any person or entity who discharges waste to land. They do not impose unique requirements on local agencies or public entities. Therefore, even without the statutory exemption contained in Government Code 17516, increased costs associated with these regulations do not give rise to an entitlement to reimbursement by the state because they do not mandate an increase in governmental service by local agencies.

#### **ALTERNATIVES CONSIDERED**

The State Water Resources Control Board [State Board], considered various alternatives in developing revised Article 5, such as: not revising the article; forestalling the revision of the article until the entire chapter could be revised at one time; and revising the article to use the language of federal language in 40 CFR 264 Subpart F verbatim. If the article were not revised at this time, the regulations would not be consistent with the regulations of either the Department of Health Services or the USEPA, resulting in unnecessary difficulties for owners or

operators of waste management units receiving hazardous waste (sites subject to all three sets of regulations). The federal could not be copied verbatim because the Chapter 15 regulations apply to a broader spectrum of waste management units and because their goals differ somewhat from their federal counterparts. Therefore, the revised regulations are necessary to provide assurances that discharges of waste to land are in compliance with applicable waste discharge requirements and containment standards, and to ensure that any leakage from waste management units will be detected before waste constituents and leachate have an adverse impact on the quality of waters of the state; no alternative considered by the State Board would be more effective in carrying out this purpose or would be as effective and less burdensome to regulated dischargers.

#### GENERAL COMMENTS ON REVISED ARTICLE 5

##### Comment on Data Availability

Comment: Commentors representing volunteer organizations requested that the revised regulations state that the monitoring data for each waste management unit be made available at a designated public library near the waste management unit so that interested persons can have access to the data during non-working weekday hours and on weekends because regional board locations and dischargers' facilities hours do not provide convenient data access. [4F, 5C, 7D, 13M, 19B, 20D, 20H] Another commentor requested that regional boards ensure that interested parties, including potentially-affected water utilities, be better apprised of and be given the opportunity to be involved in the procedures required by Article 5 and also provisions be made in Article 5 for access to regional board information. [52C] One commentor suggested that when new data is sent to update the requested library file that the update be announced in a local newspaper. [20E] One commentor requested a periodically updated index of documents and publications be made available for review at the regional board. [7D]

Response: The regulations were not changed in response to these comments because the regional boards are already in full compliance with the Public Records Act which requires agencies to make their files open to the public during normal working hours and to provide copies of documents to requesting parties at a reasonable price.

Comments on Self Regulation

Comment: Several commentators stated that self regulation, including self monitoring, is not a suitable approach to apply at waste management units because it flies in the face of the profit motive that substantially influences discharger behavior. [1B, 4C, 5B, 19A, 20A] The discharger should not be allowed to select the Monitoring Parameters or Constituents of Concern. [13G]

Response: The regulations were not changed in response to these comments, for the following reasons. Chapter 15 does not provide for self regulation by the discharger. All regulation is done by the regional board in the form of Waste Discharge Requirements that particularize the regulations to the specific waste management unit involved. This approach is extended to the monitoring done under both repealed Article 5 and revised Article 5 in that the regional board adapts the Waste Discharge Requirements to the monitoring and response requirements of the article to the particular conditions found at the unit. Likewise, the discharger is required to propose a list of Monitoring Parameters and a list of Constituents of Concern, but the regional board makes the final determination and may reject, accept, or modify either of these lists. Although the discharger collects and reports the monitoring data, there is no advantage gained by having the discharger pay a third party to do this work because the profit motive would apply to the independent contractor as well; the discharger can change contractors at will if the contractor reports results that are disadvantageous to the discharger. Limited staffing precludes the regional boards from doing the day to day sampling and analysis at the thousands of units throughout the state. Therefore, self-monitoring is the method of choice and its potential negative aspects are mitigated by the regional board's substantial punitive power in the event that a discharger's sampling, analysis, or reporting practices are found to differ from those stipulated in their unit's Waste Discharge Requirements.

These comments bring up a viewpoint that is inconsistent with State Board policy. These regulations are based on current State Board policy. The commentators are invited to address their policy suggestions to the State Board as an issue separate from this rulemaking.

Comments Requesting Extension of the Comment Period

**Comment:** Several commentors requested that the comment period be extended. [4A, 4I.5, 7E, 11D, 20W]

**Response:** In response to this comment, the comment period was extended for more than 45 days.

**Comment:** The 15 days provided for responding to the changes made to the regulations in not enough time, considering the considerable number of changes made. Another 45 day comment period should be provided. [56K]

**Response:** The regulations were not changed in response to this comment because the comment did not request a change. However, in response to the request posed by the commentor, the Administrative Procedures Act [APA] requires no more than a 15-day comment period following changes which are within the scope of the Informative Digest. In addition, there was not enough time left in the statutory one-year rulemaking duration, specified in the APA, for a longer comment period to be provided.

Comments Supporting Revised Article 5

**Comment:** Revised Article 5 uses a technically sound approach to monitoring and analysis that will provide early, reliable indication of releases and also provides the regional board with the flexibility to require a response that is appropriate for each release discovered. [12C, 16A] The use of Monitoring Parameters as surrogates for the longer list of Constituents of Concern is an effective, economically practical approach to monitoring. [2B, 12D, 16B, 26A]

**Response:** This comment did not require any change in the revised regulations.

**Comment:** The application of the RCRA statistical methods to non-hazardous waste management units is appreciated because it should result in many less false positive determinations while maintaining reliable detection. [2C, 26B]

**Response:** This comment did not require any change in the regulations.

**Comment:** This rulemaking represents a desirable and effective integration of the State and federal hazardous waste regulations. [11A,35A] The California Integrated Waste Management Board fully supports the joint rulemaking efforts between the Department of Health Services in collaboration and the State Board to obtain authorization from the U.S.E.P.A. to administer the RCRA program in the state. [44A]

**Response:** This comment did not require any change in the regulations.

**Comment:** Two commentators stated that revised Article 5 is well conceived, clearly written, and represents a great improvement over repealed Article 5 and that this will benefit the public, the regional board staff, and the regulated community. [2A,12B]

**Response:** This comment did not require any change in the regulations.

#### **Changes Needed in this Article Now and in Future Revisions**

**Comment:** Revised Article 5 will not provide adequate protection of waters of the State because it contains the following faults and omissions. The adoption of revised Article 5 in its present form appears inevitable; therefore, if these proposed changes cannot be implemented in this rulemaking, the State Board staff should be instructed to begin revising Article 5 (and the rest of the chapter) to ensure that these improvements are made:

- a) the revised article is not based on a sufficiently broad inclusion of existing understanding of the behavior and makeup of wastes and leachates;
- b) under repealed Article 5 the staff of some regional boards were allowing significantly deficient groundwater monitoring programs for existing municipal landfills. Revised Article 5 will not alter this. Because of these perceived failures to protect waters of the State, the article should require State Board staff to review and comment on the adequacy of all water quality monitoring programs approved by staffs of regional boards, including efforts to monitor the unsaturated zone. In addition, State Board staff should be required to

address the adequacy of implementation of the monitoring program for each waste management unit at no less than three-year intervals;

- c) the revised article will not provide for a high degree of reliability in detecting leakage from municipal landfills. The current practice of typically requiring only one upgradient and two downgradient wells is absurd considering the fact that leaks from an FML-type liner system typically occur at discrete points, producing a narrow plume that easily bypasses widely-spaced downgradient wells. The article should be revised to require the discharger to demonstrate that the monitoring system assures a mandatory minimum 95% probability of detection of point-source leaks occurring anywhere in a landfill, considering the site-specific hydrogeological and waste management unit characteristics;
- d) the revised article does not explicitly protect domestic water use of groundwater. Currently, regional boards are typically requiring municipal landfills to monitor for and clean up only a fraction of the constituents found in their leachate. There is far too much focus upon "priority pollutants" at the expense of other hazardous and non-hazardous constituents which degrade groundwater to the point that it is no longer suitable for domestic use. Even changes in hardness and aesthetic quality can impair this important beneficial use. Cleanup should be required of all constituents that are believed to be derived from the unit, not just so-called "constituents of concern" or priority pollutants;
- e) at no time should waste management units be allowed to be sited in an area where water that is suitable for domestic consumption cannot be cleaned up to its background quality in the event of a release. In addition, any units situated over such a groundwater body should not be granted the use of concentration limits greater than background [CLGBs] on the basis of technological or economic reasons;
- f) DHS's drinking water MCL's should be specifically included as a cap for CLGBs in cases where the affected waters are or could be used for domestic consumption;
- g) the article should specifically prohibit the siting of waste management units above fractured bedrock or in other areas

where groundwater flow direction and velocity are significantly difficult to predict reliably;

- h) the article should require that wells which have had their well screens encrusted by leachate precipitates be replaced by a new well rather than being cleaned by dumping acid down the well, as commonly occurs under present practices;
- i) in the event of a statistically significant increase, retests should not be allowed unless the data involved can be shown to be the result of a specific error;
- j) protection of "human health and the environment", as used throughout the article, should be revised to provide for protection of "human health and the environment, and the quality of groundwater for domestic water supply use";
- k) requirements for Class III units should be no less stringent than for Class I and Class II units;
- l) less emphasis should be placed upon statistical determinations to detect leaks. Instead, experts in groundwater quality monitoring and data review should be involved in examining the monitoring data to determine the likely presence of a release. [62A]

**Response:** The regulations were not changed in response to these comments for the following reasons.

Suggestion (a) is too broad to be able to be considered without a list of explicit examples.

It is not appropriate for the State Board to write regulations with the mind-set that the regional boards will refuse to apply those regulations, as proposed in Suggestion (b); rather, the State Board is empowered (1) to promulgate regulations that the regional boards use in regulating discharges of waste to land and (2) to adjudicate appeals brought against any regional board by a discharger or by the public. Any oversight that the State Board considers necessary would not be administered through regulations but rather by the application of either State Board policy or statutory powers.

The 95% certainty provision of Suggestion (c) is not practicable because there is no way to determine when one is 100% certain of detecting a release; instead, the revised article requires an array of monitoring points and background monitoring points that

will provide the earliest possible detection and measurement of a release [e.g., Subsection 2550.7(b)(1)(B)].

The proposed article does not need to explicitly protect domestic water from all potential chemicals that a waste management unit could contain [Suggestions (d) and (j)] because domestic water supplies are included under the scope of the term "human health and the environment", which is protected by the revised article, and because the discharger is required to clean up all Constituents of Concern, a term which encompasses all constituents i.. or derived from the waste management unit.

Suggestions (e) and (g) cannot be implemented because the current rulemaking does not encompass the siting criteria of Article 3 of this chapter and because it is not reasonable to force a discharger to do the impossible, such as cleaning up to a concentration that is not possible to reach short of a quasi-infinite cleanup duration.

It is not necessary to implement Suggestion (f) because MCLs are automatically applicable in cases where a release affects potable water [see Subsection 2550.4(e)].

Suggestion (h) should not be incorporated into the revised article because control over the upkeep of wells and other monitoring points is better accomplished by regional board staff, who can consider the many different factors involved.

Suggestion (i) is not appropriate because all statistical methods allowed under the revised article will give a false indication of a release at least one time out of every 100 comparisons, resulting in a virtual certainty of being involved in investigating non-existent releases unless a verification procedure is allowed.

Suggestion (k) is not strictly appropriate because Article 3 of this chapter, which is not the subject of this rulemaking, provides a different performance goal for Class III units than for Class I and Class II units [Classes I and II must not release but Class III units must avoid degrading beneficial uses]; nevertheless, the only differentiation by waste class in the revised article involves either (1) the need to spread out the submittal of proposals to meet the requirements of this article, so that the regional board has enough time to properly consider each proposal [Subsection 2550.0(f)], or (2) carry-overs from the federal regulations that are only retained for the purpose of demonstrating equivalency with the federal regulations of



40 CFR 264 Subpart F [e.g., the requirements for yearly Appendix IX analyses throughout the duration of the compliance period].

Suggestion (1) is inappropriate because experts on opposing sides of a question can reasonably disagree, resulting in an ongoing lack of resolution; whereas, a statistical method that is agreed upon by all parties beforehand produces rapid response [i.e., evaluation and corrective action] when the method indicates that a release has occurred. In addition, Subsection 2550.1(a)(3) empowers the regional board to require evaluation monitoring in cases where physical evidence of a release exists in the absence of any such indication from the monitoring point network. Lastly, aberrations seen in the graphical portayals of all monitoring data [required pursuant to Subsection 2550.7(e)(14)] can result in a request for an evaluation of the cause of the problem, pursuant to Subsection 2510(d)(2) of this chapter.

#### Comments on Application of the Porter-Cologne Water Quality Control Act

**Comment:** One commentor interpreted the water quality control provisions of the Porter-Cologne Water Quality Control Act to charge the State Board with protecting waters of the State from any degradation and stated that the revised regulations appear to allow a lessening of the current level of monitoring and cleanup at landfills where leakage has been detected. [17A] Another commentor stated that the revised regulations would result in greater public risk to the public living in the area of waste management units. [5A] Revised Article 5 appears to reduce the current level of water quality monitoring and possibly reduce the level of cleanup at landfills where leakage has been detected. [3A]

**Response:** The regulations were not changed in response to these comments for the following reasons. The current minimum monitoring level is four samples per year whereas the revised regulations retain this minimum. In addition, the revised regulations include a new requirement to identify and monitor for Constituents of Concern. This is intended to provide field verification that the assumptions made in the selection of Monitoring Parameters are valid. Monitoring for the list of Monitoring Parameters must be performed at a frequency that is based upon the ground water flow rate and the physical conditions at the site.

In cases where leakage has occurred from a unit, the aquifer often cannot be restored to its pre-release condition, regardless of the effort expended. The revised regulations require the cleanup to be carried out to the maximum degree that technical and economical limitations permit, and in any case require cleanup to the background concentration in cases where this can be achieved. This is fully as effective as the degree of cleanup that would be attained under repealed Article 5, and the improved quality of the statistical analyses required has every potential to result in earlier detection of a release than would occur under repealed Article 5. Therefore, revised Article 5 represents an overall improvement in the quality of protection afforded to human health and the environment, as compared to repealed Article 5.

#### Comment on Interfacing With TPCA and Proposition 65

**Comment:** Several commentors inquired as to how revised Article 5 interfaces with the Toxic Pits Cleanup Act and with Proposition 65. [4D,4E,20B,20C]

**Response:** No change in the revised regulations was needed to respond to this comment. The Toxic Pits Cleanup Act [TPCA] and Proposition 65 impose specific obligations on certain dischargers and public officials. However, these obligations do not affect the State Board's discretion to develop appropriate monitoring programs for dischargers of waste to land.

TPCA [Article 9.5, commencing with Section 25208, of Chapter 6.5 of Division 20 of the Health and Safety Code] prohibits discharges of liquid hazardous wastes or hazardous wastes containing free liquids at surface impoundments after January 1, 1989 unless ground water monitoring is conducted in accordance with various applicable regulations, including the State Board's regulations governing discharges of waste to land. The revised regulations modify requirements applicable to surface impoundments to the same extent that they modify requirements applicable to other waste management units, and dischargers who own or operate surface impoundments will have to ensure that their monitoring programs remain in compliance with all applicable requirements when the revised regulations take effect. There is no need to address this situation explicitly in the regulations.

"Proposition 65" [Safe Drinking Water and Toxic Enforcement Act of 1986, which added Chapter 6.6, commencing with Section 25249, and several other separate sections to Division 20 of the Health and Safety Code] prohibits certain discharges of chemicals known to the State to cause cancer or reproductive toxicity, and requires public officials who obtain knowledge of illegal discharges to report the discharges to local officials [Health and Safety Code Section 25180.7]. Leakage from a waste management unit could result in an illegal discharge subject to Proposition 65. Thus monitoring pursuant to the repealed or revised regulations may entail reporting pursuant to Proposition 65, and dischargers may be subject to Proposition 65 enforcement provisions. However, there is no need to address this situation explicitly in the revised regulations.

#### **Comment Concerning Reporting Requirements**

**Comment:** One commentor asked why the revised regulations do not require the discharger to submit reports with a certified letter, return receipt required. [20M]

**Response:** No change to the revised regulations is needed to address this comment because dischargers can always elect to make required submittals in this fashion if they are concerned that they may subsequently have to prove that such reports were received by a regional board. Return of a receipt for certified mail would be evidence that the mail was delivered to a regional board [e.g., as a defense against enforcement actions for failure to submit a required report]. Certified mail adds nothing to the technical or legal value of documentation in regional board files from the perspective of the regional board. Requirements that technical and monitoring reports be prepared by technically qualified persons, or that the discharger verify the contents under penalty of perjury ensure that a regional board can rely on the reports in its regulatory program [e.g., as the basis for enforcement action].

Comment on Memorandum of Understanding [MOU] or Memorandum of Agreement [MOA] For Implementing Revised Article 5

**Comment:** There should be either an MOU or an MOA between the State Board and the Department of Health Services [DHS] concerning how their regulations are to be implemented and this MOA/MOU should be completed and subjected to public comment prior to adopting the regulations. [4I,20S,20X] There should be a MOU between the State Board and the Department of Health Services so that Class I units are not regulated by both agencies at the same time. [36A,36E,57A] The local enforcement agency [LEA] and the Waste Board should be involved in any regional board decisions involving the determination of sampling frequency, data submissions for Class II and Class III waste management units, and the choice of analytes to be monitored. Such coordination will avoid unnecessary inter-agency conflict. [59I,68B{page 2}]

**Response:** No change in the revised regulations is needed to accommodate the concerns of these commentators because the comments do not address substantive provisions of the revised regulations. While it may be highly desirable for the State Board and DHS to address each agency's respective role in implementing these regulations as a component of the State's "RCRA-equivalent" hazardous waste control program, a formal agreement is not required as a prerequisite to rulemaking. A similar situation exists relative to coordination between the regional boards, LEAs, and the Waste Board in regulating Class II and Class III waste management units. Part of the reason that coordination between agencies is not mandatory is that the State Board, DHS, the Waste Board, and LEAs retain independent [although largely concurrent] statutory authority over dischargers under their purview. Each agency has its own permitting process that provides ample opportunity for consultation between the discharger, the agencies and other interested persons. Interactions between agencies will depend on the individual circumstances in each case. However, since both the regional boards and DHS will be applying substantively identical monitoring regulations, opportunities for conflict between the requirements prescribed by each agency should be minimal. In the case of Class II and Class III waste management units, where more disparate regulations may be implemented simultaneously, coordination between all agencies involved should be a matter of policy rather than of regulatory mandate.

**Comment on Review of Response to Comments**

**Comment:** One commentor asked if another public meeting would be held in Los Angeles to address responses made to the comments received during the public comment period. [20T]

**Response:** No change to the revised regulations is needed to address this comment because it raises a purely procedural issue. However, in response to the commentor's question, no additional hearings are planned for the Los Angeles area. The Administrative Procedures Act [APA] requires a 45 day public review period of revised regulations and a public hearing if requested. The APA also requires administrative agencies to explain how revised regulations have been modified in response to comments or why the regulations have not been modified. This explanation, which must be included in the final Statement of Reasons submitted to the Office of Administrative Law, and provides a part of the agency's demonstration that the regulation is necessary. Pursuant to the Open Meetings Act the State Board employs a procedure whereby Board actions are generally presented at a public "workshop" for discussion prior to being acted on at a public meeting. Commentors may seek to raise their concerns in this forum, but there is no explicit requirement for the State Board to address all comments or present revised responses for public scrutiny.

**Comments on Revising Article 5 Exclusive of Other Chapter 15 Articles**

**Comment:** Two commentors took exception to the fact that Article 5 was being revised without addressing the effects that this revision may have on other portions of Chapter 15, giving as an example the provision in revised Section 2550.0(d) which eliminates the applicability of Section 2510(b) and (c) of Article 1 to the provisions of Article 5. [21D,21E,58C] Two commentors suggested that all of Chapter 15 should be revised at one time. [10C,21G]

**Response:** No change to the revised regulations is needed to address this comment because the elimination of reliance on "engineered alternatives" as applied to monitoring programs was an intentional consequence of the State Board's determination to ensure consistency between these regulations and federal minimum standards for hazardous waste management. The USEPA commented that the repealed regulations prescribing monitoring for

hazardous waste management units could be regarded as less stringent than the federal regulations because dischargers could attempt to evade prescribed monitoring through the "engineered alternative" provisions in Subsections (b) and (c) of Section 2510 of this chapter. Therefore, in order to ensure that monitoring requirements for discharges of hazardous waste will implement the "RCRA-equivalent" provisions of the revised regulations, the State Board explicitly abrogated the applicability of Subsections (b) and (c) of Section 2510 to monitoring requirements under revised Article 5. Furthermore, monitoring is a unique activity and staff knows of no other alternative that could meet the performance goals.

**Comment:** The revision of Article 5 without at the same time revising other related articles can lead to confusion. In particular, definitions in Article 10 are used in a variety of other articles. Changes to these definitions should not be driven solely by reference to revisions of Article 5. The informative digest does not address these effects upon the other articles. The changes made to terms in Articles 5 and 10 change the meaning of these terms in other articles and the public has been afforded no opportunity to comment upon how these changes affect other articles. [39A, 39B, 39D]

**Response:** The regulations were not changed in response to this comment for the following reasons. Staff has reviewed the application of the affected terms throughout the remaining portions of Chapter 15 and has determined that the revisions constitute no significant change in the application of these terms within the remainder of the chapter. In all cases, the revisions serve to clarify the intent of these terms throughout the chapter.

#### Comment on Constituent Subsets

**Comment:** Two commentors asked that the relationships between the following terms be presented in a flow chart or otherwise clarified in the Statement of Reasons: Monitoring Parameter; indicator parameter; Constituent of Concern; hazardous constituent; waste constituent; concentration limit; and water quality protection standard. [18A, 25A]

**Response:** The regulations were not changed in response to this comment because responding to the comment did not require it.

However, with the exception of the water quality protection standard, the definitions of each of these terms will be included in the upcoming revisions to Article 10 of Chapter 15, which will be carried as close to concurrently with that of Article 5 as possible. It was not deemed necessary to include a definition of the term water quality protection standard because Section 2550.2 of the revised article provides a detailed explanation of this term.

#### Comment on Consistency With Subtitle D

**Comment:** Two commentors asked the State Board to address how revised Article 5 will achieve consistency with EPA's Subtitle D regulations when the latter are promulgated. [18C,25C]

**Response:** No change to the revised regulations is needed to address these comments because the USEPA has yet to promulgate proposed standards implementing Subtitle D of the Resource Conservation and Recovery Act [RCRA]. When the USEPA does promulgate regulations requiring specific monitoring requirements at waste management units for non-hazardous solid waste, the State Board will amend regulations applicable to such waste management units to ensure consistency with any federal minimum standards. However, since the revised regulations apply the same monitoring requirements to discharges of hazardous and non-hazardous waste, it is unlikely that substantial adjustments will be needed to conform to any anticipated standards promulgated under Subtitle D.

#### Comment on Achieving Compliance

**Comment:** Two commentors took exception to the use of the phrases "out of compliance", "achieves compliance with", "achieve compliance", "in compliance", "determining compliance" and "evaluate compliance" throughout revised Article 5 in reference to the water quality protection standard because, according to their interpretation, moving from one program to another in accordance with the provisions of the Waste Discharge Requirements and with the requirements of Article 5 should be considered being in compliance. [18B,18D,18F,18U,18V,18X,18AA,18AD,18AK,18AP,18BB,18BE,18BG,18BK,25B,25D,25F,25U,25V,25X,25AA,25AD,25AK,25AP,25BB,25BE,25BG,25BK]

**Response:** The regulations were not changed in response to this comment for the following reason. The conceptual framework of "compliance", as provided under revised Article 5, is that if a release from a waste management unit occurs, the discharger has violated the Waste Discharge Requirements, and if the release has caused a concentration limit at a monitoring point to be exceeded by a statistically significant amount during detection monitoring, the waste management unit is out of compliance with its Water Quality Protection Standard. During corrective action, a discharger is still out of compliance with the Water Quality Protection Standard until the concentration limits for cleanup specified in Waste Discharge Requirements are achieved. The act of carrying out the corrective action measures specified in the Waste Discharge Requirements does not absolve the discharger of responsibility for the release; therefore, the discharger is out of compliance until the corrective action is successfully completed.

#### Comment on CEQA

**Comment:** Several commentators suggested that the State Board should address the potential environmental consequences of the revised regulation in accordance with the procedures prescribed by the California Environmental Quality Act (Division 13, commencing with Section 21000, of the Public Resources Code, "CEQA") for projects that could have a significant effect on the physical environment. [1A, 1C, 1D, 5D, 13A, 13B, 13C, 13D, 13E, 13F, 13N, 15B, 19C, 20N, 20O, 20P, 20Q, 20R, 20U, 20V]

**Response:** No changes in the revised regulations have been made in response to these comments because the comments do not address the substantive provisions of the revised regulations.

While there can be little doubt that rulemaking could constitute a project under CEQA, there is substantial room for disagreement as to whether or not a particular rulemaking proposal should be regarded as a project that could have a significant effect on the physical environment. Land use planning by local governments has a direct effect on the physical environment because the subsequent issuance of building permits for projects that comply with the plan are ministerial acts. Therefore, it has been held by California courts that local governments must comply with the environmental impact disclosure provisions of CEQA as a prerequisite for such planning.



The revised regulations which are the subject of this rulemaking will not have an analogous effect on the physical environment. The hypothetical sampling and monitoring activities prescribed in the revised regulations could not possibly affect the physical environment until applied to a particular waste management unit, and that application would be a separate project subject to CEQA: i.e., discharge of waste that could affect the quality of the waters of the state to land for treatment storage or disposal. Such a discharge would be subject to discretionary permitting by local government agencies as well as by Regional Water Quality Control Boards. Only in the context of a particular discharge could the potential impact, if any, of the revised regulations be assessed, because it would be only in such a context that the physical environment that might be affected could be identified.

Categories of projects that are not anticipated to have a significant impact on the physical environment have been identified by the Secretary for Resources in the Guidelines for Implementation of the California Environmental Quality Act contained in Title 14 of the California Code of Regulations, Section 15000, et seq. (as authorized by Section 21084 of the Public Resources Code). This rulemaking qualifies for categorical exemption as an action by a regulatory agency for the protection of the environment (14 C.C.R. 15308). The revised regulations are intended to ensure that persons who discharge waste to land will comply with the substantive requirements imposed upon them to protect waters of the state for their identified beneficial uses and to ensure the accountability of dischargers whose discharges cause or threaten to cause conditions of pollution or nuisance. Monitoring requirements which, in the abstract, cannot have a significant impact on the physical environment satisfy the criteria for exemption under this category.

For these reasons, and the practical impossibility of addressing the hypothetical environmental impacts of the revised regulations on the physical environment, this rulemaking proposal has not been subjected to the review process prescribed by CEQA.

The commentators who raised this issue expressed concerns that without CEQA review the public would be denied a meaningful opportunity to evaluate the revised regulations and possible alternatives. The rulemaking process prescribed by the Administrative Procedure Act ensures ample public participation in any proposal by an agency to adopt regulations. The revised text of the regulations, together with an initial Statement of Reasons addressing the specific regulatory purpose and the

factual basis for the agency's determination that the particular regulations are necessary, must be made available for public review for a 45-day period after the agency gives notice of the proposed rulemaking. Every comment submitted during the public review period must be addressed by the agency, and the agency must either modify the revised regulations to accommodate the comment or explain why the revised regulations were not modified. Commentors also have access to all of the technical documentation underlying the agency's revised regulations, contained in the rulemaking file.

#### Comment on the Nature of the Public Hearing

**Comment:** One verbal commentor at the August 9, 1989 public hearing on these regulations in Los Angeles was perplexed that no legal address was displayed at the hearing, that the regulations were not noticed through the regional board, that no publications were available at the back of the room other than air quality publications, and that the hearing was not for the Public Utilities Commission. [7A]

**Response:** This comments did not require a change in the regulations, so none was made. The hearing was noticed in accordance with the Administrative Procedures Act; and copies of the proposed regulations were available at a table in the hallway outside the hearing room for those who may not have brought their copy with them.

#### Comment on RCRA Interim Status Facilities

**Comment:** One commentor suggested that Class I facilities that are operating under RCRA Interim Status and which are either closing or have not accepted hazardous waste prior to promulgation of revised Article 5 should be exempt from it. [28B]

**Response:** No change was made to the revised regulations in response to this comment because repealed Article 5 was applicable to Interim Status sites and revised Article 5 would continue to apply to these sites.

**Comment on Application to Non-Leaking Sites**

**Comment:** Inactive waste management units should not be made to conduct monitoring and reporting if it can be shown that they have not yet leaked hazardous constituents. [28C] Monitoring should not be required at sites where migration of Constituents of Concern will not occur. [28E, 30D] The federal regulations under 40 CFR provide exemptions for engineered structures and for waste piles, but the revised Article 5 regulations do not. Perhaps the regional board should be given discretionary authority to grant such exemptions. [37B]

**Response:** The regulations were not changed in response to these comments because a lack of leakage in the future can only be determined by conducting monitoring throughout that future. The only way to protect human health and beneficial uses of waters of the State from potential degradation is to continue monitoring for as long as the waste in the unit could pose a threat to water quality. Article 5 applies to all waste management units because it is not possible to "engineer" a structure such that there is no possibility of a leak; therefore, it would not be appropriate to forego monitoring of an "engineered structure".

**Comments on Dual Agency Control**

**Comment:** Dischargers should only be subject to one agency with regards to ground water monitoring. Currently the regional boards have charge of this function. [28D]

**Response:** The regulations were not changed in response to this comment for the following reasons. The Department of Health Services [DHS] is required to have their own ground water monitoring regulations in order to obtain authorization from the EPA to manage the RCRA program in the State (Class I units only). The State Board is required by the Porter-Cologne Water Quality Control Act to regulate dischargers handling materials that could have an adverse impact on beneficial uses of waters of the State (Class I, II, and III units). Both agencies have a clear mandate for such regulations. Because the revised regulations are expected to replace the existing federal requirements presently enforced by DHS and the USEPA, and because the State Board's revised regulations parallel regulations being revised by DHS, monitoring and response programs designed to bring a Class I unit into compliance with revised Article 5 should satisfy the requirements of DHS, the USEPA, and the State Board.

**Comment:** Comments submitted to the State Board's revised Article 5 amendments also apply to the California Department of Health Services' revised Article 6 of Chapters 14 and 15 of Title 22. [18BU,25BU,34A]

**Response:** The State Board and the Department of Health Services have jointly reviewed all comments submitted for their revised Articles 5 and 6, respectively, and have made appropriate changes to both sets of regulations. The State Board concurs with the responses made by the Health Department's staff in that agency's SOR, insofar as those responses pertain to the portions of revised Article 5 that address Class I units.

**Comments on the Article's Application to the Various Classifications of Waste Management Unit**

**Comment:** Proposed Article 5 unjustly distinguishes between the threat to water quality posed by releases from Class I and Class II units as opposed to releases from Class III units. [67C {pages: 21,27}] Water resources do not receive adequate protection under the draft regulations because Class II and III landfills are subject to less stringent regulations than are Class I landfills and because statistical procedures favor reducing monitoring and remediation costs of the discharger without consideration of the increased risk of contamination and the high cost of cleanup. For example, Subsection 2550.0(f) provides more time for submittal for Class II and III units than for Class I units. This is an inappropriate approach because Class III units often pose a more significant threat to water quality than do Class II and Class I units. In reality, wastes in all classes of unit typically remain mobile and hazardous for longer than the life of the liner and cover, especially in the case of the waste in Class III landfills (erroneously called "non-hazardous waste"); therefore, the requirements for siting, design, construction, closure, post-closure operation and maintenance, monitoring, groundwater remediation, and financial assurance associated with Class III landfills should be strengthened to reflect the real hazards such facilities pose to groundwater quality. The current tendency to rely primarily upon "priority pollutants" for monitoring and clean-up purposes is especially outmoded. [67L {pages: 27,28,34-37,38-44}]

**Response:** In response to these comments, except for the situations described below, the regulations have been revised such that they apply the same to all classes of waste.

One situation in which the classes of waste are differentiated is where logistics mandate that report submittals under Subsection 2550.0(f) be staggered over time so that the regional board will not be overwhelmed by all submittals arriving within a short time interval [i.e., Subsection 2550.0(f)]. There are only about 80 Class I units in the state, whereas there are approximately 1600 Class II and Class III units. The sequencing of submittals provided in Subsection (f) is necessary to insure that there is enough time to provide a careful review of each submittal.

There are some parts of the regulations where an EPA requirement is appropriately applied only to Class I units. For example the Appendix IX analysis required under Subsection 2550.8(k)(2) is necessary in order to demonstrate equivalency with the federal regulations; however, this expensive analysis is not likely to provide a benefit commensurate with its cost if it were to be applied to Class II or Class III units. Therefore, this requirement is applied only to Class I units.

However, it is not possible to make changes to portions of this chapter that are not the subject of this rulemaking [e.g., the siting, design, and construction requirements of Articles 3 and 5 of this chapter], as suggested by the commentor.

**Comment:** Revised Article 5 should apply only to Class I units because: (1) the authorization process under RCRA applies to Class I facilities only; (2) DHS has no authority to adopt regulations or regulate Class II and III facilities; (3) federal regulations under RCRA Subtitle D (for Class II and Class III units) are expected to be finalized by April 1, 1990 and the California Integrated Waste Management Board [CIWMB] is the agency designated to implement the provisions of Subtitle D; and (4) the regulations for ground water monitoring of Class II and Class III facilities are exactly the regulations the State Board committed to jointly develop with the California Integrated Waste Management Board. [44B,68A{page 1}]

**Response:** The regulations were not changed in response to this comment for the following reasons. The RCRA regulations under Subtitle C and DHS' revised regulations apply only to Class I units, not to Class II or Class III units. Revised Article 5,

however, applies to Class I, Class II, and Class III units. This difference stems from the fact that the State Board is authorized by the Porter-Cologne Water Quality Control Act to promulgate regulations addressing all discharges of waste to land. It would be inappropriate for the State Board to improve the monitoring provisions for Class I units and fail to also augment the provisions for Class II and Class III units. There is virtually no difference in the basic monitoring approach that is appropriate for the three classes of waste; therefore, it is appropriate to consolidate the monitoring and response provisions for all classes of waste under a single article.

Staff expects the revised Article 5 regulations to be more stringent than the Subtitle D regulations, based on staff review of the proposed Subtitle D regulations; therefore, it makes no sense to put off improving the monitoring and response regulations for Class II and Class III units -- the revised article will work well for all classes of waste. If it becomes evident that there are inconsistencies between the final version of Subtitle D and Article 5, then these differences can be addressed in a separate rulemaking updating the revised article.

**Comment:** Revised Article 5 should not apply to mining waste units because this is inconsistent with having a separate article for regulating such units. [12A]

**Response:** The regulations were not changed in response to this comment because the monitoring and response provisions by which a waste management unit should be regulated is not a function of the type of waste that the unit contains, so long as that waste has the potential to degrade water quality or have other impacts to human health or the environment. In light of this fact, creating a separate set of monitoring and response provisions that apply only to mining waste units would constitute a needless redundancy in the regulations.

**Comment:** The revised article has many places where the applicability to Class II and Class III units is not sufficiently differentiated from the portions that apply only to Class I unit. [23A]

**Response:** The regulations were not changed in response to this comment because the wording is already sufficiently clear for proper application and understanding. Throughout the revised article, subsections which apply only to Class I waste management

units are specifically and clearly broken out, typically by a leading phrase such as "For Class I waste management units only...." All requirements lacking such a lead-in are intended for general application to all classes of waste management unit. The portions which may have caused the commentor confusion are those portions which address hazardous constituents, as these requirements apply under the revised article to all classes of waste management unit, yet the phrase derives from the federal regulations which apply only to Class I units. The reason for the general application of this phrase is that many Class II and Class III units have been found to release hazardous constituents. For example, it is quite common to detect hazardous constituents leaking from Class III waste management units. The nominal classification of such a unit has little to do with the risk that the hazardous constituents it leaks can pose to water quality, human health or the environment, therefore such requirements are generally applied irrespective of the nominal classification of the leaking unit.

**Comment:** One commentor was concerned about the applicability of Article 5 to non-hazardous "activities". The commentor pointed out that the interpretation of who is affected by Chapter 15 varies between regional boards. [58A]

**Response:** The regulations were not changed in response to this comment for the following reasons. Both the repealed and the revised Article 5 apply to hazardous and non-hazardous discharges of waste to land. The individual regional board must determine if the discharge is a threat to water quality. Also, it is not clear what the commentor means by activity.

#### Comments on Monitoring Parameters Versus Constituents of Concern

**Comment:** Once a leak has occurred, these revised regulations require that the discharger in evaluation monitoring evaluate water quality for the limited list of Monitoring Parameters rather than going after all of the Constituents of Concern. Constituents of Concern are only monitored at five-year intervals. This does not seem adequate for a leaking unit. [17B]

**Response:** The regulations were not changed in response to this comment because the commentor overlooks the fact that Subsection 2550.9(b) requires the discharger conducting an evaluation monitoring program evaluate the three-dimensional distribution of each Constituent of Concern in the zone affected

by the release in addition to the normal monitoring for Monitoring Parameters. This Constituent of Concern delineation is required within 90 days of detecting a release and cannot be satisfied by the use of a list of surrogates [i.e., the Monitoring Parameters] except insofar as the Monitoring Parameters assist the discharger in obtaining a preliminary estimation of the extent of the release. The requirement to delineate the nature and extent of each Constituent of Concern can only be satisfied through installing assessment wells and then analyzing samples from these and from the affected monitoring point wells for the full spectrum of Constituents of Concern individually. Semi-annual or even quarterly monitoring of monitoring point wells is not an efficient way to accomplish plume delineation, in fact is of little use at all for this purpose. The 90-day limit placed upon the plume delineation phase of the evaluation monitoring program provides an expeditious, reliable first step in the preparation of a corrective action program.

With respect to the monitoring that is done at the point of compliance wells and other monitoring points affected by the release, note that the list of Monitoring Parameters for an evaluation monitoring program must include all hazardous constituents that have been detected in ground water [Subsection 2550.9(e)(2)]. This provision assures that basic information regarding concentration trends will be monitored where the plume emerges from beneath the unit and at other affected monitoring points. Additional Monitoring Parameters are intended to detect the arrival of slower-moving components of the release.

The commentor's reference to a minimum five-year interval for monitoring for all Constituents of Concern subsequent to a release appears to be in error. Subsection 2550.9(e)(4) provides that during an Evaluation Monitoring Program, the regional board may require the discharger to monitor for Constituents of Concern "periodically" to validate that the Monitoring Parameters are still doing their job of detecting changes in release [e.g., the arrival of previously undetected waste constituents]. This is done as often as the regional board determines is necessary. There is no reference to a "five-year" minimum interval for this validation because the entire Evaluation Monitoring Program is not expected to last long. Perhaps the commentor was thinking of the analogous provision in detection monitoring [Subsection 2550.8(g)] which does contain a five-year minimum update period. Such a minimum is appropriate because a Detection Monitoring Program can theoretically last for decades



without a release being indicated; however, such a requirement would be nonsensical in evaluation monitoring because of that program's short duration. In either program, the frequency of testing for Constituents of Concern is set by the regional board.

#### Comments on Human Health and the Environment

**Comment:** Considerations of beneficial use in repealed Article 5 seem to have been replaced by the more general standard of "human health and the environment" in revised Article 5, and equal importance seems to have been assigned to all ground waters of the State, without regard to the fact that the inherent quality and availability of ground water varies greatly throughout the state. [12I, 12K, 36B, 36F] A number of Subsections in the revised article require the regional board to protect "human health and the environment". This provision exceeds State and regional board authority. Section 208 of the Health and Safety Code permits DHS to adopt rules for the protection of human health. Section 13001 of the California Water Code, however, entrusts the State and regional Boards with the protection of water quality. This is clearly a different goal. [42C, 44C, 59B, 68D {page 3}] The term "human health and the environment" is very broad, including impacts on domestic water supply water quality; however, this aspect of the phrase's application would be clearer if it were revised to read "hazard to human health or the environment, or adversely affect the quality of the water for domestic water supply use" throughout the proposed regulations. [67N {page 3}]

**Response:** The regulations were not changed in response to this comment because the standard of "human health and the environment" used in the revised article contains all factors addressed by the "beneficial uses" standard used in repealed Article 5 [including domestic water supply use] without exceeding the authority granted the State Board under the Porter-Cologne Water Quality Control Act, and because the revised article contains many provisions in which consideration of beneficial uses is used either directly or indirectly [i.e., via consideration of human health and the environment] to determine the most appropriate action [e.g., Subsections 2550.1(b), 2550.4(d), 2550.4(e)(3), 2550.4(d)(1)(G), 2550.4(d)(1)(H), 2550.4(d)(2)(H), 2550.4(d)(2)(I), 2550.4(e)(1), 2550.7(e)(7), 2550.7(e)(9)(C), 2550.7(e)(9)(D), 2550.7(e)(9)(E), 2550.8(f), 2550.9(e)(3), 2550.9(g), 2550.12(a), and 2550.12(c)]. In addition, the existing quality and potential uses of the waters being affected by a release are also given reasonable

consideration in the revised article with regard to the setting of appropriate cleanup standards [e.g., Subsections (d)(1)(D), (d)(1)(E), (d)(1)(F), (d)(2)(C), and (d)(2)(G) of Section 2550.4]. In effect, the term "human health and the environment" is equivalent to the term "beneficial uses of waters of the State" in the context in which these regulations are applied. The revised article provides the regional board with adequate opportunities to customize corrective action measures to the local site conditions.

#### Comments on Changes From Repealed Article 5

**Comment:** The changes in the revised article, relative to repealed Article 5, do not address the many failures of the existing regulations as documented by both government and private studies. Instead of making standards more explicit and enforceable, the revised regulations continue existing ambiguities and continue to place the regional board at a disadvantage in enforcement and implementation situations. [46A]

**Response:** The regulations were not changed in response to this comment because the comment is non-specific.

**Comment:** Current Chapter 15 only calls for sampling and statistical analysis to be carried out at the point of compliance. [36V]

**Response:** The regulations were not changed in response to this comment because the comment does not suggest a change. By way of clarification, however, the federal term "point of compliance" differs considerably from "points of compliance" term used in repealed Article 5 of Chapter 15. Under the latter, each monitoring point is a point of compliance regardless of its placement relative to the waste management unit; whereas, in the federal usage the term refers to an imaginary vertical surface along the downgradient boundary of the unit along which monitoring is conducted. These two terms and their usages are easily confused; therefore, revised Article 5 adopts the federal usage of the term "point of compliance" and clearly provides for the placement of monitoring points there as well as placing additional monitoring points at other locations as necessary to provide the earliest possible detection of a release. In this way, the free placement of monitoring points under repealed

Article 5 is retained while at the same time bringing the related terminology into accord with the federal usage.

#### Comments on Limitations To Corrective Action Options

**Comment:** The revised regulations under Subsection 2550.10(c) and Section 2550.12 should expressly recognize containment and hydraulic controls as appropriate corrective action measures. [36AF]

**Response:** The regulations were not changed in response to this comment because the suggested remedies are of temporary use and do not constitute full and complete elimination of the threat to human health and the environment that is posed by a release from a classified waste management unit. The use of these temporary measures as adjuncts to a more permanent remedy is not forbidden by the revised regulations. However, the revised regulations do not confuse temporary containment methodology with measures providing a permanent elimination of the threat posed by the release.

#### Comments on the Treatment Zone

**Comment:** The regulations appear to indicate that the vertical extent of the treatment zone can now be determined by site-specific conditions, in accordance with theories concerning attenuation of waste constituents in the unsaturated zone. [12F, 12G, 16D]

**Response:** The regulations were not changed in response to this comment because the vaguely inferential nature of the comment in combination with its lack of specific reference to portions of the revised article did not support or indicate a specific change. However, in reviewing all portions of the revised article dealing with the treatment zone, no language was encountered which would support the commentor's contention. The term "treatment zone" is used in the revised regulations only in Section 2550.12, which addresses land treatment units, of which the treatment zone is a constituent part. No other type of waste management unit has a treatment zone.

Neither repealed Article 5 nor revised Article 5 addresses the maximum thickness of the treatment zone. That limitation is

contained in Subsections 2530(c) and 2532(b)(5) of Article 3, which together allows this zone to have a maximum depth of five feet below the original soil surface, with the simultaneous requirement that the base of the treatment zone no be less than five feet above the maximum anticipated elevation of the ground water surface. These restrictions in Article 3 still apply, and the revised article is carefully worded to exclude any consideration of attenuation in the setting of cleanup concentrations; for example, Subsection 2550.4(f) of the revised article sets the point of exposure at the point of compliance so that considerations of attenuation cannot be used.

The State Board recently released a literature review on this subject, which was compiled by the Department of Land, Air and Water Resources, University of California, Davis, and entitled A Review of the State of the Art: Predicting Contaminant Transport in the Vadose Zone [State Board publication 90-17 CWP, July 1990; contained in this rulemaking file as Item IV.E.3.]. This study repudiates the use of attenuation in the manner proposed by the commentor because "the efficacy of accurately predicting the attenuation and eventual location of solutes or constituents in the vadose zone remains undeveloped." The study further states that "A major recurrent theme in the literature is the need for more detailed field studies in order to better understand basic vadose zone processes that affect contaminant transport....The lack of such studies has meant that available theoretical transport models are largely untested...and considerable uncertainty over the validity of particular modeling approaches remains." If attenuation occurs, so much the better; however, our inability to reliably predict its occurrence, its duration, and its other manifestations precludes placing any reliance upon it for purposes of setting concentration limits.

#### Comments Outside the Bounds of This Rulemaking

**Comment:** The alleged state-of-the-art cap which is supposed to prevent the spread of all toxic chemicals is doing a very poor job and it seems like we have a long way to go to prevent the spread of waste disposed of in landfills. [14B]

**Response:** The regulations were not changed in response to this comment because it does not address any requirement or topic which would be suitable in an article dealing with monitoring and response programs.

**Comment:** Recycling should be encouraged in order to decrease our dependence upon waste management units. [14D]

**Response:** The regulations were not changed in response to this comment because it does not address any requirement or topic which would be suitable in an article dealing with monitoring and response programs.

**Comment:** It seems that few environmental groups have taken the opportunity to review this rulemaking in depth. [15A]

**Response:** The regulations were not changed in response to this comment because no specific change was requested. However, this rulemaking has been duly noticed in accordance with the California Administrative Procedures Act. In addition, all individuals on the mailing list compiled for the 1984 promulgation of Chapter 15 were notified. All individuals or groups wishing to be added to this mailing list for future rulemakings can have themselves or their organization added to this list by means of a simple written request.

**Comment:** Article 5 should be revised to stipulate that any contamination of ground water by Class III landfills is considered a potentially significant public health threat. Any discharge of contamination, independent of whether or not any water quality standard or waste discharge requirement objective is exceeded, should trigger the requirement that the discharger immediately initiate a staged response program including increased monitoring, plans for possible remediation of the contaminated ground water and prevention of further contamination by the landfill. [47F] There are many aspects of Chapter 15 that are now known to be out of date and should, therefore, be updated. For example, the leachate from Class III landfills is known to encourage the growth of microorganisms; the accumulated bio-mass from such growth can completely plug the leachate collection and removal systems [LCRS] of current Chapter 15 design. Toxic waste (Class I) typically does not support such growth. The USEPA therefore suggests a different design for Subtitle C hazardous waste landfills than for Subtitle D municipal landfills. [67R {page 41}]

**Response:** The regulations were not changed in response to these comments because they would require modifications to Articles 3 and 4 of this chapter, which are not within the scope of the this rulemaking.

**Comment:** Chapter 15 should clearly state that, due to practical limits to regulatory actions, some quantities of hazardous wastes will be deposited into nonhazardous waste landfills. Monitoring programs for Class III landfills need to be designed and operated to observe potential discharge of leachate associated with hazardous wastes. [47G]

**Response:** The regulations were not changed in response to this comment for the following reasons. The revised article already requires the list of Constituents of Concern to include all waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the unit [revised Section 2550.3]. Changes to the wording of portions of this chapter other than Article 5, such as the design and operation of units, are outside the scope of the this rulemaking.

**Comment:** Definitions, including "decomposable waste" and "inert waste", should be reconsidered to take into account advances made in understanding the chemical, physical and biological mechanisms involved in the transformation and movement of landfill wastes. [47H]

**Response:** The regulations were not changed in response to this comment because the definitions section of this chapter is in Article 10, which is outside the scope of the this rulemaking.

**Comments on Statistical Sample Size [i.e., the Number of Individual Samples Used in the Statistical Analysis] or Sampling Frequency**

**Comment:** Subsections 2550.7(e)(12)(B)1. & 2. call for either four samples twice a year or one sample quarterly. Permitting only four samples annually is based on non-scientific considerations and is inadequate to protect the groundwater resource, especially in cases where a release occurs in pulses [e.g., wet-winter/dry-summer mediterranean climate can cause pulsed releases]. Neither of these sampling schemes is adequate to show seasonal fluctuation. Subsection 1. would permit taking four samples in immediate succession twice yearly; an inappropriate approach. Likewise the requirement for sampling quarterly for obtaining background data under

Subsection 2550.7(e)(6) does not provide enough data to determine seasonal variations and trends. Most of the allowed statistical tests rely upon the Central Limit Theorem, yet the small sample sizes prescribed by the regulations are not large enough to provide a normal distribution of sample means. This small sample size is also insufficient to provide a picture of the distribution, as required in Subsection 2550.7(e)(9)(A & F); therefore, nonparametric tests are more appropriate.

[67A {pages: 1,6,9,25,28,52,53,68-69}] Most of the statistical test methods under Subsection 2550.7(e)(8) rely heavily upon the normality of the distribution [e.g., the standard deviation values of 1.645 and 1.96 in Subsection (e)(8)(E)5.a.].

Therefore, a performance standard should be added to the regulations requiring a demonstration that the data is normally distributed [and if not that a distribution-free (non-parametric) test should be used]. Using the Kolmogorov-Smirnov test for normality, it would take around 220 data points to reject the normality of a distinctly non-normal distribution at the 95% confidence level; whereas, a distribution that was only slightly different from normal could only be proven non-normal by using thousands of data points. Consequently, unless thousands of data points can be generated it is not possible to have much confidence about how data are distributed.

[67P {pages: 23,29,55,56,58}]

**Response:** The regulations were not changed in response to this comment for the following reasons.

The quick turnaround for resampling/retesting assures that even pulsed releases will be detected and verified. The amount of detail needed on the background data (e.g., trends, fluctuations, etc.) depends upon the type of statistical method used (ANOVA needs less than prediction limit). Therefore, the requirements in the regulations are a minimum or starting point, allowing the regional board to require more background data as needed.

The slow changes due to having a wet and a dry season once each year are adequately displayed with quarterly sampling, however some statistical methods would require more for their own background data needs. This should be determined on a site-specific basis rather than by structuring the regulations to assume the worst-case scenario.

The parametric statistical methods which are listed (e.g., ANOVA) all assume the data is somewhat normally distributed; however, these methods are extremely robust to deviations from normality. In other words, these methods work remarkably well in all cases

where the distribution does not depart severely from normality. Therefore, there is no compelling reason to require a parametric method to be validated by taking "thousands" of background data points. Where not invalidated either by the distribution itself or by the proportion of non-numeric data points, the parametric methods are superior because they have a higher statistical power when small sample sizes are used [e.g., a parametric ANOVA might need four or five samples per monitoring point to have the same power that a nonparametric ANOVA would have with from eight to ten samples per monitoring point]. Given the high tolerance for non-normal distributions exhibited by most parametric methods, it is not environmentally conservative to require a less sensitive statistical method unless the individual situation dictates otherwise.

Nonparametric tests are provided primarily for those cases in which comparisons must be made using data which has a high proportion of Non-Detect or Trace (non-numeric) determinations, but they could also be used in cases where a qualified statistician determines that a numerical distribution cannot be adequately transformed to approximate a normal distribution. It is inappropriate for the regulations to preempt the discretion of statisticians analyzing site-specific data by requiring that only nonparametric methods should be used.

Dr. Neil Willits, State Board Statistical Consultant, had the following to say relative to these comments.

**Regarding Comment No. 67A:** "There are really two questions here and two statistical issues at stake. The statistical issues are (1) how much sampling is necessary to detect or characterize seasonal fluctuation, and (2) how much sampling is necessary to determine an appropriate probability distribution for the observational errors on which to base a parametric testing procedure. These questions need to be addressed prior to the institution of a monitoring program and the accompanying statistical package for evaluating the data. At this stage, it's reasonable and prudent to require more detailed monitoring information than would be necessary in routine detection monitoring. In this situation, four to eight yearly samples represent a minimum requirement, and it's the regional board's prerogative to require additional sampling. Once these questions have been satisfactorily answered, it shouldn't be necessary to validate the assumptions regarding the distribution and possible trend in the data on a continual basis.



"A related issue is how best to determine whether the normal distribution is an appropriate one on which to base the statistical procedures. On page 55 of the comments [ED: RMF Item VII.C.67.], Drs. Hromadka and Whitley discuss the sample sizes that would be necessary for a Kolmogorov Smirnov test to distinguish between a Normal distribution and a Uniform distribution with the same first two moments. In my opinion, this is a poor choice of a test for normality, since it's a test that's designed to be used with data from any alternate distribution. The sorts of deviations from normality that would cause the most problems for a parametric testing procedure would be either high kurtosis or skewness. There are tests that do a better job of detecting these sorts of non-normality, such as a Wilk-Shapiro test or the tests of skewness or kurtosis in a normal sample. Secondly, it should be noted that if the data were skewed to the right, which is the most plausible deviation from normality for this type of data, then the actual power of the parametric procedures would exceed their nominal levels. By contrast, nonparametric methods (such as Kruskal Wallis tests or nonparametric prediction intervals) require a substantial increase in sampling to achieve comparable power, and aren't as easily modified to take multiple comparison considerations into account. There are undoubtedly situations in which nonparametric methods would be preferable to parametric ones, but this is far from being uniformly the case."

**Regarding Comment No. 67P:** "I commented about this following comment 67A [ED: see immediately preceding paragraph]. I suggested some better tests for detecting important deviations from normality and indicated that (in my opinion) the most likely deviations from normality would result in greater, rather than reduced sensitivity. Nonparametric testing methods aren't uniformly preferable, due to the increased sampling requirement that are typically entailed."

**Comment:** The regulations propose minimum sampling requirements for Monitoring Parameters under the detection and evaluation monitoring programs of only four samples at each point semi-annually [Subsections 2550.8(f) and 2550.9(e)(3)]; these should be increased. [46H]

**Response:** The regulations were not changed in response to this comment because the commentor provided neither substantiation nor reasoning concerning the proposed change. At this time there is no reason to further increase this minimum sample size.

Comment: As supported by the attached paper by Dr. Robert Gibbons, replicate sampling from a single well may be a less conservative sampling procedure than collecting individual samples depending on the statistical methodology selected. Dr. Gibbons suggests that specifying a minimum number of samples in the regulations is inappropriate. The regulations should allow sampling frequencies to be proposed by the discharger and adopted by the regional board pursuant to the statistical method adopted. [18AN, 18BA, 25AN, 25BA] The mandated sampling frequency in this article does not afford the regional board flexibility to consider site-specific sampling frequency. [40A]

Response: [ED: The position stated in this response is appropriate for an earlier version of the regulations. Subsequently, the minimum sampling frequency has been set at one sample quarterly along with quarterly statistical analysis. The response is retained in order to provide a broader base of understanding of the statistical issues involved.] The revised regulations were not changed in response to the above comments for the following reasons. For a given significance level and for a release of a given magnitude, the power of a statistical analysis [i.e., its ability to detect the release] is an increasing function of the small size [i.e., number of samples analyzed] so it is wise to avoid using too few samples.

With regards to the paper submitted by the commentators in support of their viewpoint Dr. Neil Willits, statistical consultant to the State Board, had the following comments:

"[T]he comment that cites Gibbons' paper misinterprets his findings. Gibbons **doesn't** say that you don't need replicate samples from each well. Rather, he makes a case that a statistical testing procedure that compares each of the replicate samples against the background level will have comparable statistical properties to a procedure that just compares the mean of the replicate samples against the background level. This comparison is based on the assumption that you have taken as many samples as you would have otherwise, and you just analyze them differently. As described, Gibbons' method wouldn't cause any change in the sampling pattern.... Gibbons proposes that separate tests be run to compare each of the replicate observations against the background level, and...it does so at the cost of running four times as many hypothesis tests, and consequently the Type I error

rate for the entire procedure will be roughly four times as high as for a single test based on the mean of the four replicates. I doubt seriously that such an increase in the Type I error would be acceptable to facility operators.

"Finally,...I don't like a couple of aspects of the numerical example that's contained in Gibbons' paper. [H]e bases his tests of individual observations (or the mean observation) on an error term that's calculated by treating all observations taken at upgradient sites as independent and identically distributed. I ran a few simplistic linear models in SAS that showed that there was significant variation from well to well, [that] there was a significant increase in the upgradient concentrations over time, and that there was some indication of seasonal variability in the observations.... One of the jobs in formulating a statistical testing procedure is to take effects such as these into account, and he doesn't seem to have done so. Secondly, Gibbon's procedure leans very strongly on the assumption that individual observations are normally distributed, since the Central Limit Theorem indicates that the mean of four observations would be more nearly normal than would a single observation.

"In summary, let me say that (1) the comment that cites Gibbons' paper misinterprets his suggestion, (2) as stated, Gibbons' method involves a considerable increase in the Type I error of testing for a release, and (3) in my opinion, Gibbons' numerical example represents a misapplication for his data."

In light of this requirement, of Dr. Willits' analysis of Dr. Gibbons' paper, the stringency of the change revised in this comment is not sufficiently supported to permit it to be implemented in the revised regulations.

**Comment:** The minimum sampling and statistical analysis requirements of the revised article are too stringent because a single outlier in the data will force a facility into corrective action without a chance to verify the outlier. A good alternative to this procedure would be to take one sample four times yearly and use a prediction interval procedure to test for a release. If a release is indicated, a resampling and reanalysis would be carried out without incorporating the data

from the first sample into the reanalysis. A similar approach can be taken with nonparametric prediction intervals as well. [50A]

**Response:** [ED: This response reflects an earlier version of the regulations. Subsequently, the regulations have been changed to allow a procedure similar to that proposed in this comment. The response is retained in order to provide a broader base of understanding of the statistical issues involved.] The regulations were not changed in response to this comment for the following reasons, as quoted from an April 16, 1990, letter from State Board statistical consultant Dr. Neil Willits, of the U.C. Davis Statistical Laboratory:

"The first two and a fraction pages of the comments criticize the proposed changes on the basis that a single outlier in the data (whether it results from faulty transcription or faulty analysis) will force a facility into corrective action without a chance to verify the outlier. As an alternative, they proposed a monitoring scheme which is based on prediction intervals and which includes a resample. There are at least a couple of problems with their argument and proposal.

"First, it isn't the intent of the proposed changes to eliminate the role of an independent quality assurance or quality control program that would screen the data and eliminate outliers prior to the statistical analysis. It should be a routine part of monitoring to check over the data for such errors. Moreover, they should be quite easy to catch if they happen to arise from a transcription error. It should be pointed out that in case of laboratory or sampling error, an outlier would be less routine to detect, since the mere fact that a given sample takes on an unexpectedly large value is insufficient evidence to discard that data. However, a good quality control program that includes regular blank and split samples ought to be able to do so in most cases. The logic behind the inclusion of the original data in the statistical analysis following a resample was that presumably there was nothing demonstrably wrong with the original data.

"Second, the proposals that violations that are detected using prediction interval methods be validated using a resample and that corrective action be initiated only if the repeated sample should yield a similarly extreme

outcome have quite dire consequences for the Type II error rate of the monitoring procedure. First, since each down-gradient observation is being tested independently against the standard set by the background observations, there must be sufficient evidence in that single observation to warrant rejecting the null hypothesis [that the downgradient and background concentrations have the same distribution]. Then, should that happen, it would have to repeat itself the very next time for the resampling data, in order to pass into corrective action. It's well known that if the data are normally and identically distributed, then the t-test is the most powerful test for detecting an increase [actually the t-test is the uniformly most powerful invariant]. A test based on prediction intervals can't equal its performance. Moreover, even if the test based on prediction intervals was as powerful, the effect on an independent retest is that what had been a Type II error rate of  $\beta$  will be replaced by  $1 - (1 - \beta)^2 = 2\beta - \beta^2$ , which approximately doubles the Type II error rate. While I can sympathize with the problems created by excessive Type I errors, in my conversations with the relevant officials in USEPA, they were singularly unsympathetic to modifications that would cause an increase in the Type I error rate, much less doubling it. In fact, they were reluctant to accept the sort of a retest proposed in these regulations, despite the fact that it results in a truly negligible loss of statistical power....

"A third, more general, objection that I have to the use of prediction intervals in monitoring situations is that it is very much a parametric method and quite insensitive to departures from the assumption that the data come from a normal distribution. In monitoring, it will be an extremely rare situation in which you will have sufficient data to feel assured that the data are even remotely normally distributed. T-tests likewise require the assumption that the data are normally distributed, but the most crucial assumption is that the sample means are normally distributed, a fact that should be approximately true [due to the Central Limit Theorem], as long as the underlying distribution is somewhat close to normal. By contrast, prediction intervals require that individual observations come from a normal distribution, and require the setting of a prediction limit that's based on the tail behavior of normal random variables.

By choosing the prediction limit based on a normal distribution, whether the data are actually normal or not, there will be at best a weak relationship between the true Type I and Type II error probabilities and their nominal levels. It should be noted that the nonparametric prediction intervals that are discussed on pages 7 and 8 of the comment and in the attached paper get around this difficulty. If they were proposing a nonparametric prediction interval scheme, then my only objection would be to the use of an independent retest, providing that their sample sizes were chosen to yield equivalent power to a parallel ANOVA-based method."

**Comment:** The revised regulations require a frequency of monitoring [four samples at each monitoring point at least twice yearly] that costs twice as much as taking a single sample each quarter, yet it is not at all clear what environmental benefit this additional cost produces. [50B]

**Response:** [ED: This response reflects an earlier version of the regulations. Subsequently, the regulations have been changed to allow a procedure similar to that proposed in this comment. The response is retained in order to provide a broader base of understanding of the statistical issues involved.] The regulations were not changed in response to this comment for the following reasons, as quoted from an April 16, 1990, letter from State Board statistical consultant Dr. Neil Willits, of the U.C. Davis Statistical Laboratory:

"On page 3 of the comments, they object to the increased sampling requirement of four...observations per well. I think they're arguing on both sides of a question. The sample size, Type I error rate, and Type II error rate are all intrinsically related. For example, any attempt to reduce Type I error while maintaining a low Type II error rate must involve an increase in sample size. In separate sections, they argue for a reduction in Type I errors and then for a reduction in sample size. these are incompatible objectives. While they state that a reasonable balance between false positive and false negative rates is achieved by their proposed methodology, the reasonable balance they describe exists in their eyes only. It is at odds with what the USEPA considers a reasonable balance. Personally, I don't agree entirely with USEPA's idea of a reasonable balance either, but I

don't feel as a result that I can strike an independent reasonable balance of my own invention.

"In response to their example at the bottom of page 3, I'll grant that you can think up scenarios in which the data aren't identically distributed and in which some other sampling technique may be more powerful, but I can hardly see this as a justification for reduced sampling frequency. I haven't had the time to digest their simulation results [i.e., Figure 1] in the detail I'd like, but I'm pretty sure I don't believe them. My main reason for saying this is that they present the power of their prediction limit method as a single curve, whereas it clearly should depend on how many of the four observations at a well are contaminated. [That is, the more contamination there is, the better chance you have of detecting it, pretty much regardless of the method that's used.]...."

**Comment:** The statistical procedures stipulated in the revised article produce an unacceptably high Type I error rate [frequency of falsely-indicated releases]. The inclusion of an independent, verification resample [not including the data which indicated a release] would control this excessive error rate.[50C]

**Response:** [ED: This response reflects an earlier version of the regulations. Subsequently, the regulations have been changed to allow a procedure similar to that proposed in this comment, but requiring at least two such discrete retests be carried out in order to keep the Type II error level in check. The response is retained in order to provide a broader base of understanding of the statistical issues involved.] The regulations were not changed in response to this comment for the following reasons. The Type I error rate without retest is the same as that provided under 40 CFR 264.97. The State Board is required under Subsection 13172(d) of the California Water Code to promulgate regulations that are no less stringent than their federal RCRA counterparts. In addition, the revised regulations do contain provisions for a retest procedure which will lessen the Type I error rate. The retest procedure in the revised article requires that the data which indicated a release must be combined with the new retest data and then the combined data must be reanalyzed with the same statistical procedure as used to indicate the release, but run at a 95% confidence level. The retest approach in the revised article does not provide the degree of decrease in the Type I error level that the commentor's proposal does because

the commentor's version essentially ignores the initial indication, thereby requiring two independent, sequential indications of a release, a procedure which effectively doubles the Type II error rate [releases are missed twice as often]. Any significant increase in the Type II error rate is unacceptable to the USEPA and any regulations including such a retest method would be demonstrably less stringent than their federal counterpart. The retest procedure in the revised regulations provides a considerable buffer against Type I errors but has almost no change in the Type II error rate. As stated by Dr. Neil Willits, State Board statistical consultant, in his April 16, 1990, letter analyzing this comment,

"...a fair balance between Type I and Type II error is in the eye of the beholder, it depends heavily on whether you stand to gain or lose from false (or true, for that matter) positives. The fact remains that we aren't completely free to come to our own conclusions on this matter, since EPA's position on this matter must be dealt with. As for whether methods based on prediction intervals need to be concerned about the Type I error, I know that the guidance document seems to imply that they don't, but I don't believe that you can choose a method with an arbitrarily high Type II error rate, just because it comes under the heading of prediction intervals."

In any case, revised Subsection 2550.7(e)(9)(A) contains a performance standard which requires that the statistical method revised by the discharger "shall be the least likely of the appropriate methods to fail to identify a release from the waste management unit"; therefore, the method revised by the commentor would not be acceptable under the revised article even if the USEPA were to permit such a retest method to be considered.

**Comment:** Revised Subsection 2550.7(e)(9)(B) lists some Type I error limitations, and then states that "This performance standard does not apply to tolerance intervals, prediction intervals, or control charts". However, the subsection that addresses tolerance intervals and prediction intervals [Subsection 2550.7(e)(9)(D)] includes similar Type I error restrictions. If we are to follow this rule, then we cannot have any more than 5 monitoring wells, since  $0.050/5 = 0.01$ , which is the minimum Type I error permitted for individual comparisons. As soon as we have more than 5 wells, but are unable to take them into consideration in the statistical analysis, the false-positive rates greatly increase. [50D]



**Response:** The regulations under Subsection 2550.7(e)(9) were not changed in response to this comment for the following reasons.

The relationship pointed out by the commentor does not represent an inconsistency in the regulations. The performance standard under Subsection (B) addresses statistical methods which compare downgradient data with either a concentration limit or with background data from upgradient. Subsection (D), by contrast, applies to prediction intervals and tolerance intervals, a methodology which typically uses "intra-well comparisons" in which the monitoring point's present concentration data is compared with its own historical concentration data, which acts in place of background data from upgradient. These two approaches are fundamentally different, but that does not preclude portions of the two performance standards from being worded identically, as appropriate.

The commentor's statement that the statistical procedure effectively limits the number of downgradient monitoring points is correct; however there is no other choice in this instance. The regulations do not permit individual monitoring point comparisons to be made at a Type I error rate of under 0.01 because to permit a lower error rate would be to adversely affect the Type II error rate, thereby decreasing the ability of the monitoring system to reliably identify a release. This restriction does have the effect of increasing the experiment-wise Type I error rate, but the requirement is necessary in order to maintain equivalency with the corresponding federal requirements under 40 CFR 264.97. This facet of the federal regulations tends to inhibit the use of more than five monitoring points per waste management unit. Staff has compensated for this as much as possible by designing the retest procedure [under revised Subsection 2550.7(e)(8)(E)] to favor dischargers who have a larger number of monitoring points installed. At this time, no additional accommodation can be granted on this point.

**Comment:** Chapter 15, and therefore Article 5, seem to be written with a presumption that the geology underlying waste management units follows a "layer cake" model and that each waste management unit should be required to have a monitoring and response program. However, this is not always the case. For example: there are many small, remote sites where the potential for water quality degradation is practically nonexistent and the cost of monitoring would exceed the operational cost of the site; some sites either have no underlying ground water or the ground water

is at great depth, with more than 100 feet of clay soils intervening; some sites are underlain by soils which do not allow operation of vadose zone sampling equipment; and it is not possible to determine the ground water flow direction reliably at some sites. What is wrong with the use of trend analyses in place of statistical approaches? Why do the regulations require the water quality protection standard to be in the Waste Discharge Requirements [WDRs], instead of in an attachment to the WDRs that is more easily updated by the regional board executive officer? Many of these limitations seem to derive from the fact that Article 5 is written from a RCRA model. Perhaps the article should be split into a RCRA-like article for Class I units and another article for Class II and Class III units which provides the regional board with broader discretion. [51A]

**Response:** The regulations were not changed in response to this comment for the following reasons. The regulations under this chapter are based upon the assumption that both the discharger and the regional board staff know enough about the geology and hydrogeology of the site that an effective monitoring and response program can be designed, using as a basis the site characterization information submitted pursuant to Article 9 of this chapter. If the regional board finds that there is no affectable ground water under the site and no affectable surface water in the area around the unit, then there is no reason to cause the discharger to be subject to this chapter, at which point the question of how to apply Article 5 becomes moot. However, the Porter-Cologne Water Quality Control Act does not provide the State Board with the discretion to ignore potential adverse affects upon waters of the State simply because the site is remote, or because the ground water flow direction is hard to characterize; therefore, the revised article is designed to apply to all waste management units. If a waste management unit cannot be effectively monitored, for any reason, then that unit should not be permitted to continue operation because there is no way to tell if water quality is being impaired by a release from that unit. The statistical methods under the revised article represent a considerable improvement over those contained in repealed Article 5. Statistics are not needed to identify a large release having strong concentrations of waste constituents, which are easily discerned by visual inspection of the data. The advantage of statistical methods is that, when properly applied, they enable the detection and measurement of a release in its early stages, when the slight increase in the concentration of a waste constituent in the water is small relative to the background concentration. The use of statistics therefore permits earlier detection of a release and provides some

assurance against the tendency to falsely identify a release on the basis of a transient concentration fluctuation.

**Comment on Class I Units Returning To a Detection Monitoring Program During the Compliance Period**

**Comment:** Revised Article 5 should not allow a Class I unit to return to detection monitoring during the Compliance Period. Subsections 2550.8(n) and 2550.10(i)(3) describe the activities which the discharger must undertake when returning to detection monitoring after the successful completion of a corrective action program during a Compliance Period. Although the 40 CFR 264 Subpart F regulations do not specify what programs should be maintained during the compliance period, the July 26, 1982 Federal Register preamble [p. 32294] states that either the compliance program or the corrective action program will continue through the compliance period under Section 264.96. Thus it is clear that under Subpart F, after the successful completion of a corrective action program within the compliance period, the discharger is to return to compliance monitoring. For revised Article 5 to be equivalent, it would be necessary for a Class I unit to return to a "modified" detection monitoring program, which is similar in its monitoring requirements to Subpart F's compliance monitoring. A "modified" detection monitoring program would include Appendix IX monitoring annually [as already required in revised Subsection 2550.98(n)], semi-annual monitoring for hazardous constituents found in the ground water as a result of the Appendix IX monitoring, performing a statistical test on the data gathered, notification requirements for the data gathered, and triggering of corrective action if a statistically significant release is observed. Either: a) "modified" detection monitoring requirements [as discussed above] should be placed in the appropriate place in revised Article 5, or; b) Subsections 2550.8(n) and 2550.10(k)(3), and any other Subsections which refer to the implementation of detection monitoring after corrective action during the compliance period should be revised to delete those references. [27A136]

**Response:** In response to this comment, the change recommended in option "a" has been made to the revised regulations. Subsection 2550.8(n) has been modified to include a requirement for Class I units that the Monitoring Parameters for each medium must include all hazardous constituents that have been detected in that medium due to a release from the waste management unit.

Semi-annual monitoring and statistical evaluation are required for all Monitoring Parameters during a detection monitoring program. Anytime statistically significant evidence of a release is found, corrective action is "triggered". [Note: under the revised regulations each new release will require a new evaluation monitoring program to evaluate the nature and extent of contamination and to prepare for corrective action.]

### Comments Relating to Definitions

**Comment:** The notice included changes to the definitions in Article 10, yet the notice concerned itself only with the revisions to Article 5. [21A]

**Response:** In response to this comment, the revised changes to the definitions under Article 10 of Chapter 15 are being carried out under a separate rulemaking that is running concurrently with that of Article 5.

**Comment:** Changing the term "land treatment facility" to "land treatment unit" results in the elimination of a defined term that is used in Subsection 2532(b)(4) and in Section 2584 of Chapter 15. [21B]

**Response:** The regulations of revised Article 5 were not changed in response to this comment because the term "land treatment facility" was misleading; however, the definition for this term under revised Article 10 applies to both versions of the term. Regional boards regulate waste management units through the issuance of Waste Discharge Requirements. Although entire facilities [having several waste management units] may be covered in one set of Waste Discharge Requirements, each unit will have its own subset of requirements and those portions of the facility that are not part of a waste management unit are not regulated. The term "land treatment facility" was used in the repealed regulations to refer to a waste management unit at which land farming is done. The revised change in this term clarifies its usage. By retaining the old term "land treatment facility" under the definition of this term, in Article 10, the application of the term in portions of this chapter that are not part of this rulemaking remains unaffected.

**Comment:** Many comments related to definitions of new terms or changes to existing terms. [18BM, 18BN, 18BO, 18BP, 18BQ, 18BR, 18BS, 18BT, 21C, 25BM, 25BN, 25BO, 25BP, 25BQ, 25BR, 25BS, 25BT]

**Response:** The definitions were not changed in response to this comment because this rulemaking addresses Article 5 rather than the definitions under Article 10. The Statement of Reasons for Article 10 discusses the need for each new term as well as the need for the changes made to existing terms.

**Comment on Appendix IX Analysis Requirements  
For Class I Waste Management Units**

**Comment:** Subsections 2550.8(n) and 2550.9(e)(6) require Class I waste management units to monitor at least yearly for all Appendix IX constituents. Unless such a requirement must be retained to duplicate RCRA requirements, a wording change should be made to require monitoring only for those Appendix IX constituents which would be **reasonably expected** to be at the unit. The cost of these analyses is very high and the use of statistics means that more than one sample will have to be analyzed at each monitoring point. This is unreasonable for a site that is managing only a very limited number of hazardous materials (for example, a site with only one or two metals or one or two pesticides). [37C]

**Response:** The regulations were not changed in response to this comment because the approach used in revised Article 5 represents a non-substantive change from the regulations of repealed Article 5, which required yearly analyses of the entire list of Appendix III constituents [similar to Appendix IX]. The reasoning behind this is that one cannot be absolutely certain of either the content of a waste management unit or of the makeup of the plume that a release from such a unit will generate. The broad-spectrum analysis is needed to find constituents that are present in the release but which were **not** expected to be in or derived from the unit; therefore, limiting the analysis only to constituents that **are** expected to be in or derived from the unit would be counter-productive. The regulations do not require the use of statistical methods when sampling for Appendix IX constituents.

**Comment on Length of the Revised Article**

**Comment:** The revised article seems to be of considerable length. The services of a professional editor should be obtained. For example, it appears that Sections 2550.12 and 2550.10 could be combined. [37F]

**Response:** The regulations were not changed through the use of an editor, as suggested by the commentor, because under agreement between the Department of Health Services, USEPA, and the State Board, the wording and format of 40 CFR 264 Subpart F were used as a basis for the revised article and were retained to the greatest extent feasible in order to more easily demonstrate consistency with the federal regulations.

**Comment on Authority and Reference Citations**

**Comment:** The statutory authority and reference citation given for this article are unclear. Each section should state specific authority and reference, and not general provisions given at the end of the article. [44D]

**Response:** The final text of the revised regulations submitted to the Office of Administrative Law will include specific authority and reference citations for each section of the regulations. Since all of the revised regulations govern methods for dischargers to comply with requests for monitoring reports pursuant to W.C. 13267, and, in addition satisfy the legislative directive contained in W.C. 13172(d) for the State Board to adopt regulations that are equivalent to and consistent with the federal Hazardous Waste Management System regulations, the authority and reference citations for each section will be identical, as discussed in the original Notice of Proposed Rulemaking.

**Comment on Review of Regional Board Implementation of Article 5**

**Comment:** The State Board should establish a review program of the regional boards' decisions governing the administration of Article 5 and periodically make its findings public in a report. Perhaps the best way to do this would be through a continuation of the Solid Waste Assessment Test [SWAT] Program, which requires the State Board to make an annual report to the legislature concerning the status of leakage from waste management units in

the state through 1991. We recommend that this be continued on an ongoing basis. [47A]

**Response:** The revised regulations have not been changed in response to this comment because it is not directly related to the specific purpose of the revised rulemaking undertaken pursuant to the Notice published in the California Regulatory Notice Register on June 23, 1989. That Notice covered proposed amendments to regulations establishing monitoring requirements for waste management units at which wastes are discharged to land. The Notice cited W.C. 13267 as the statutory provision being implemented, interpreted, or made specific by the revised regulations. State Board oversight or review of regional board actions is governed by W.C. 13320, and regulations contained in Chapter 6 [formerly Subchapter 6] of the State Board's regulations in Division 3 of Title 23 of the California Code of Regulations. This comment also refers to continuation found under the "SWAT" program mandated by W.C. 13273. That program contemplates a one-time "snapshot" of leakage at "solid waste disposal sites" (which do not include the entire universe of waste management units subject to Chapter 15) according to a comprehensive priority ranking established by the State Board. The State Board has ranked 2242 solid waste disposal sites in 15 ranks of 150 each [with the last rank having less than 150]. It will be approximately eleven years before initial SWAT reports are submitted for all of the currently ranked solid waste disposal sites. Any extension of the SWAT program would have to come from the Legislature.

#### Comment on Remedial Action Triggers

**Comment:** The following portions of this article do not provide the regional board with sufficiently explicit guidance to be able to act preventively and catch and remediate releases before they become serious problems:

1. Dischargers need not take any remedial action unless there is either "statistically significant evidence" of a release or there is a release of "Constituents of Concern" that exceeds the Water Quality Protection Standard;
2. The regulations give very little guidance to the regional boards on choosing Monitoring Parameters;
3. The regulations give no guidance to the regional boards on setting statistical cutoffs;

4. The dischargers themselves propose both the Water Quality Protection Standards, which may exceed background, and the statistical methods which they will use.[46E]

**Response:** The regulations were not changed in response to this comment for the following reasons [listed respectively]:

1. Physical evidence of a release can be cause for initiating an evaluation monitoring [Subsection 2550.1(a)(3)]; in addition, aberrations in the graphically displayed data [required by Subsection 2550.7(e)(14)] can be the basis for requiring an investigation of the issue under Subsection 2510(d)(2) of this chapter. Barring such physical evidence or data irregularities, without the use of statistics there may not be a legal basis to substantiate the existence of a release. Instigating corrective action without knowing the nature and extent of the release would be premature because the choice and effectiveness of the remedial action measures is dependant upon the characteristics of the release. However, Subsection 2550.9(g) provides that the regional board may require interim corrective action measures where necessary to protect human health or the environment.
2. The selection of Monitoring Parameters is based on the performance standards given in each monitoring and response program [e.g., Subsection 2550.8(e)]. More specific guidance would constitute the use of prescriptive standards, which are not appropriate because they do not account for individual site and waste characteristics.
3. The choice of appropriate statistical tests is controlled by the performance standards listed under Subsections 2550.7(e)(9) [for normal statistical testing] and Subsection 2550.7(e)(8)(E) [for statistical retests], which provide that the Type I error rate [i.e., false-positive indications] for individual monitoring point comparisons shall be kept at no less than 1% for each six-month period.
4. Although the discharger does propose both the Water Quality Protection Standard and the statistical methods to be used, the discharger is also responsible for demonstrating that these proposals meet the performance standards under Subsections 2550.7(b), (c), and (d), Section 2550.3, Section 2550.4, and Section 2550.5 [for the component parts of the Water Quality Protection Standard] and Subsections 2550.7(e)(8)(E) and (e)(9) [for statistical



methods]. The regional board reviews these proposals relative to their ability to fulfill these performance standards and the regional board accepts the final version only when these standards are met. Concentration limits greater than background can only be used as cleanup concentrations for corrective action in cases where the background concentration cannot be achieved [Subsections 2550.4(a)(3), (c), (d), (e), and (h)].

### Comments on Error Rates

**Comment:** The approach to error rate determination in the regulations is questionable. For example, the two error rates of 0.05 and 0.01 in Subsection 2550.7(e)(9)(B) are somewhat arbitrary. Additionally, Subsection 2550.11(m)(2) states that a "reasonable balance" is to be provided between Type I and Type II errors. This balance is not an abstract notion in which, say, a large probability of Type I error [i.e., a false-positive determination] is inherently unreasonable even though it may be the only way to obtain adequate environmental protection against Type II errors [i.e., missed releases]. Instead the language should state that a balance between the competing economic costs of groundwater pollution and the costs of monitoring should be achieved; this would tip the scales heavily toward more stringent environmental protection. [67W {page 56}]

**Response:** The regulations were not changed in response to this comment for the following reasons. The minimum Type I error rates specified in Subsection (e)(9)(B) are admittedly somewhat arbitrary; nevertheless, the USEPA has determined that these error rates serve as a good functional minimum in controlling the incidence of Type II errors. The Type I error rate is easily predicted and controlled, whereas the Type II error rate is very hard to predict without an inordinate amount of data; however, the fact that Type I and Type II errors show a somewhat reciprocal correlation allows the Type II error rate to be controlled within acceptable limits by simply specifying a minimum Type I error rate. The USEPA's approach to this problem is practical and workable, given the fact that there is seldom enough data available to be able to reliably determine the Type II error rate.

The portion of the comment directed at Subsection 2550.11(m)(2) is invalid because this subsection has not been changed since the original proposed version of the article; therefore, the

commentor is addressing a portion of the proposed article that has not open for public comment since the close of the initial comment period. However, for the sake of clarity, the State Board does not agree that a high Type I error rate is an acceptable means of protecting water quality. For example, a procedure which always determined that there was a release (Type I error rate of 1.00) would be the most certain of recognizing a release (Type II error rate of 0.00), but only at the expense of falsely indicating a release most of the time. Such an approach is not environmentally protective because it lends little credence to the indication. By using the statistical methods in the proposed article, very few releases will be missed yet very few indications of a release will be false. Such performance fosters respect for the result of the statistical test; thereby assuring that a prompt and thorough investigation of the indication will occur.

Dr. Neil Willits, State Board statistical consultant, had the following to say regarding this comment. [NOTE: Dr. Robert Gibbons is the statistical consultant for Chemical Waste Management, Inc., and for Laidlaw Environmental {a.k.a. GSX}.]

"My comment on this is ``good luck to him'' in reference to the goal of balancing the economic costs of Type I and Type II errors. It's a laudable ambition, but even EPA shies away from this approach. This, incidentally, is a comment that I raised in one of our meetings with Robert Gibbons, and while he like I would agree with this as a goal, we haven't the foggiest idea how to implement it."

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ANALYSIS OF REVISED ARTICLE 5

The objective of the following analysis is to identify the specific purpose of each of the regulations in revised Article 5 and to explain the purpose and factual basis for requirements that are different from the federal requirements in the Subpart F regulations. In the analysis of each section, a discussion is presented with respect to: (1) the specific purpose of the revised regulations and (2) the factual basis for proposing the requirements, including the factual basis or rationale for proposing any differences between the revised regulations and Subpart F.

**REVISED ARTICLE 5 TITLE - WATER QUALITY MONITORING AND RESPONSE  
PROGRAMS FOR WASTE MANAGEMENT UNITS**

**Section 2550.0. Applicability.**

**Specific Purpose**

The specific purpose of this section is to establish the applicability of the regulations contained in revised Article 5.

**Factual Basis**

The regulations of revised Article 5 will be applied to all treatment, storage, and disposal facilities in California, regardless of their classification [i.e., Classes I, II, and III]. In 1988, Water Code Section 13172 [WC 13172] was amended by the addition of Subdivision d, which requires the State Board to:

"(d) Adopt standards and regulations for hazardous waste disposal sites which apply and ensure compliance with all applicable groundwater protection and monitoring requirements of the Resource Conservation and Recovery Act of 1976, as amended [42 U.S.C. Sec. 6901 et seq.], any federal act, enacted before or after January 1, 1989, which amends or supplements the Resource Conservation and Recovery Act of 1976, any federal regulations adopted before or after January 1, 1989, pursuant to the Resource Conservation and Recovery Act of 1976, as amended, together with any more stringent requirements necessary to implement this division or Article 9.5 [commencing with Section 25208] of Chapter 6.5 of Division 6.5 of the Health and Safety Code."

This broad mandate is applicable to all hazardous waste treatment, storage, and disposal sites in California, including both sites subject to the Federal Hazardous Waste Management System regulations implementing RCRA, and sites subject to regulation and permitting under the California Hazardous Waste Control Law [a slightly more extensive set of waste management units]. The State Board's regulations governing discharges of waste to land [Chapter 15] interprets "hazardous waste" in accordance with the criteria for the identification of Hazardous and Extremely Hazardous Waste promulgated by DHS pursuant to the

Hazard Waste Control Law [see 23 CCR 2521]. Therefore, all units and sites at which hazardous wastes are managed under the Hazardous Waste Control Law are required to meet the Hazardous Waste Management System standards referred to in WC 13172(d). This approach ensures consistency between the State Board and DHS with respect to both the manner in which hazardous waste management units are regulated, and with respect to the discharger's degree of accountability for unauthorized releases. In particular, revised Sections 2550.0 through 2550.12 include new requirements promulgated by EPA since the adoption of Chapter 15 and DHS' Standards for Management of Hazardous and Extremely Hazardous Waste [Title 22 CCR, 22 CCR 66001, et seq.] in 1984. These requirements will be applied to all waste management/regulated units subject to Chapter 15 or to DHS' regulations.

The water quality protection strategy of revised Article 5 is equally valid for protecting water quality from unacceptable degradation that can result when non-hazardous wastes are discharged to land. All waste management units are subject to Chapter 15, regardless of whether or not the wastes managed at the site are hazardous. Thus, the regulations of revised Article 5 will be applied to all waste management units at treatment, storage, and disposal facilities in California. However, there are certain requirements, involving the use of extensive lists of hazardous constituents, which will apply to Class I waste management units only.

#### Comments on Section 2550.0

**Comment:** Article 5 should be revised to state that the owner or operator of landfill-based waste management units, including Class III landfills, establish a monitoring program for closure and a post-closure funding source on a facility basis that will last for at least 1,000 years and a financial plan to support it. The financial plan shall be approved by the regional board as a condition of operating the landfill. [47C] The financial responsibility and trust fund provision of Chapter 15 should unequivocally provide funds to carry out the provisions of Article 5, including waste exhumation or restoration of containment systems when the lining deteriorates, to prevent further pollution of the groundwater. [47E]

**Response:** The regulations were not changed in response to this comment for the following reasons. Revised Subsection 2550.0(b) already requires assurances of financial responsibility for

completing corrective action for all releases from a unit, and revised Subsection 2550.10(c) provides that the corrective action measures can include source control. Revised Subsection 2550.0(d) requires that the discharger continue to monitor until either the end of the post-closure maintenance period or until the unit has had no indication of a release for three consecutive years and has completed a clean closure. The duration of the post-closure maintenance period continues until the waste in the unit no longer poses a threat to waters of the State [Section 2601]. This performance-standard-based approach provides the greatest latitude to adapt the Waste Discharge Requirements to the individual characteristics of the site and of the waste. Subsection 2580(f) of this chapter already requires the discharger to establish an irrevocable closure fund or to provide other means to ensure closure and post-closure maintenance of each classified waste management unit in accordance with an approved plan.

**Comment:** It is questionable that RCRA standards promulgated for use at hazardous waste sites should be applicable to non-hazardous waste facilities. [10A,10B,21F,23A,23C,36C,42A] Non-hazardous wastes, such as woodwaste, should not be subjected to the same monitoring and response provisions as are hazardous wastes. [23E] The regulations should give the regional board staff the latitude to handle non-hazardous sites differently than is appropriate for hazardous sites. [23D,37A] Applying hazardous waste standards to sites containing only non-hazardous waste is inappropriate. [23V]

**Response:** The regulations were not changed in response to this comment for the following reasons. Hazardous waste and "designated waste" have the potential to adversely affect human health, but even "non-hazardous" waste can cause degradation of water quality and eliminate certain beneficial uses of the water. In addition, "non-hazardous" solid waste landfills have frequently been found to be releasing considerable amounts of hazardous constituents -- this is particularly disturbing in that these Class III landfills are typically not designed to meet the performance standards that hazardous waste units must meet. Because of this threat, all classified waste management units are monitored. If the regional board determines that the waste has no potential to affect human health or the environment, including but not limited to water quality and beneficial uses, then the regional board may waive the issuance of waste discharge requirements, pursuant to WC 13269.

The appropriate approach to monitoring any classified waste management unit is primarily a function of the hydrogeologic environment underlying the unit and the mobility of the waste constituents contained in the unit. The approach is not a function of the classification of the waste in the unit. Therefore, the monitoring that would be appropriate for a Class I unit in a given hydrogeologic setting would also be appropriate for a Class III unit in that same setting. The appropriate response to any release is to delineate the release and plan an effective corrective action to minimize the effects upon human health and the environment. Although the specific corrective action measures and cleanup standards for a release are likely to differ from unit to unit, the monitoring and response methodology is the same for all classes of unit. The revised article contains adequate flexibility for the regional board to tailor the monitoring and response programs both to the risk involved and to the hydrogeologic environment underlying the unit, but it does not have the flexibility to eliminate the basic building blocks of appropriate and effective monitoring and response programs.

**Comment:** This article should apply only to Class I units. The federal Subtitle D regulations are soon to be promulgated, and the Integrated Waste Management Board [Waste Board] is the lead agency designated to implement the Subtitle D provisions. Therefore, regulations for Class II and Class III units should be drafted jointly by the State Water and Waste Boards. [59A]

**Response:** The regulations were not changed in response to this comment for the following reasons. The Water Code clearly provides the State Water Board with the authority to promulgate regulations independently from any agency other than the Office of Administrative Law. The regulations of revised Article 5 represent an update of the repealed Article 5 regulations, which addressed the discharge of all classes of waste. The federal Subtitle D regulations have been in a state of continuing development for several years; until their promulgation is final there is no basis for interaction between the Water Board and the Waste Board. When the federal regulations become final, there will be good cause to see if any of the Water Board's regulations are less stringent than their new federal counterparts. Therefore, there is no reason to hold up the present rulemaking on the basis of prospective changes in the federal regulations. Even if the Subtitle D regulations become final before the effective date of Articles 5 and 10, it is appropriate to

complete the rulemaking process prior to venturing into another revision that would cover those regulations.

**Comment:** The first sentence of the Factual Basis in the Statement of Reasons for this section states that it applies to "treatment, storage, and disposal" facilities, a phrase that is typically applied only to hazardous waste facilities. [23F]

**Response:** The regulations were not changed in response to this comment because the lack of specific reference in this section to a waste management unit's classification is intentional. The revised article applies equally to all classified waste management units, without regard to their specific classification. Where appropriate, class-specific requirements are broken out separately. The phrase "treatment, storage, and disposal" is appropriate for use with all classes of waste management unit because the discharge of waste to land includes these functions. However, the portion of this Statement of Reasons sentence referred to by Commentor #23 has been clarified to specifically include application to Class I, Class II, and Class III waste management units.

**Comment:** The concept of applying the same requirements to waste management units handling hazardous waste as is applied to those handling non-hazardous waste implies that the Class I units are not being regulated with adequate stringency. [14A]

**Response:** The regulations were not changed in response to this comment because there is very little difference in the monitoring and response programs that are appropriate for a Class I unit and those that are appropriate for Class II or Class III units. For this reason, both repealed Article 5 and revised Article 5 provide little differentiation between the monitoring and response requirements for the various classifications of unit. Classified waste management units are designed to contain waste which could affect human health or the environment. The ability to detect a release from such a unit is not predicated upon the toxicity of the specific constituents contained in the unit. The design of a corrective action program that will adequately address a release is to some extent influenced by the toxicity and concentration of hazardous constituents in the release, but the revised regulations provide for such accommodations. The release of hazardous constituents is common to all classes of unit. Those special requirements which USEPA applies to hazardous waste management units [e.g., yearly Appendix IX

analyses after discovery of a release] have been retained as applicable to Class I units only. Therefore, there is no need to provide different regulations for each waste management unit classification.

**Comment:** This section does not reflect the fact that the applicability of Article 5 is discretionary on the part of the regional board for all waste management units which were closed, abandoned, or inactive on the effective date of this chapter. [31B] The regulations are not clear concerning the applicability of this article to units which received hazardous waste at some time in the past but the waste has biodegraded to the point where it is no longer hazardous. [35A.5]

**Response:** The regulations were not changed in response to this comment because the subsection which provides the regional board with discretion in applying Article 5 to such sites [Subsection 2510(g) of Article 1 of Chapter 15] has precedence over most of the provisions within Article 5. Therefore, if the regional board decides to exercise its authority under Subsection 2510(g) to require monitoring and response programs to be initiated at a unit that was closed, abandoned, or inactive on the effective date of the chapter [December 8, 1984], then the revised Article 5 would be applied. Otherwise, Article 5 would not be applied to such a site.

One exception to this applicability approach is the case where hazardous waste has been discharged to a waste management unit after July 26, 1982. Subsection (a) of this section requires the regional board to exercise its option to apply this article to such a unit, if the unit has received hazardous waste since July 26, 1982. However, Subsection (d) of this section permits the discharger to be released from further monitoring and response program efforts if the unit has been in compliance with the Water Quality Protection Standard for three years and a clean closure has been successfully accomplished. In addition, the applicability of the article ceases at the end of the post-closure maintenance period (i.e., when the regional board determines that the waste in the unit no longer poses a threat). Therefore, a unit that is forced to comply with the provisions of this article because of having received hazardous waste after the cutoff date could still be given respite from monitoring and response programs either by completing a clean closure or by demonstrating to the satisfaction of the regional board that the waste in the unit no longer poses a threat to water quality. point that it was no longer hazardous.



**Comment:** The revised regulations go far beyond the scope of the current state and federal regulations. All provisions which represent either new regulation or an increase in scope should be changed to provide a regulatory framework which is no more stringent than are the current regulations and a grace period should be provided to permit existing units to be brought in line with the new regulations. [30A, 30B, 30I, 32C, 33A, 36G]

**Response:** With respect to the requested grace period, Subsection 2550.0(f) was added to provide dischargers with Class I units subject to the revised article with six months [from the effective date of the article] to propose revisions to their Waste Discharge Requirements that will bring their units into compliance with the provisions of the article. For Class I units, the regional board has one year after this submittal to revise the waste discharge requirements. Dischargers with Class II or Class III units are allowed up to one year from the effective date of the article to make this submittal and the regional board is allowed two years after submittal to revise the waste discharger requirements in accordance with the article.

The regulations were not changed in response to the portion of the above comment addressing increases in the scope or stringency of the revised article, because the State Board is empowered, under Porter-Cologne, to promulgate regulations which provide protection for waters of the state from discharges to land. Although one of the primary goals in drafting the revised article was to produce a melding of Article 5 with portions of Title 22, and Subpart F of 40 CFR Parts 264 and 265, some additional requirements were included to the degree that they were deemed reasonable and necessary for the effective implementation of the article with respect to the State Board's responsibility to protect waters of the State.

The philosophy used in drafting the revised article was that requirements which should be applied to all classes of waste management unit were worded without respect to the class of unit involved, whereas special requirements or considerations which apply only to one class of unit were specifically worded to address only that class of unit. The majority of the revised article is of general application (i.e., without regard to the specific class of unit) because all classified waste management units contain waste which has the potential of threatening human health or the environment. Although the degree of threat often is greatest with Class I units and least with Class III units,

the overall approach needed to provide assurance against degradation is very similar regardless of the classification of the unit. Therefore, it is appropriate to require the discharger to develop effective monitoring systems and respond clean up any release from the unit. Likewise, the cleanup level required for each constituent must be fully protective of human health and the environment. None of these limitations and considerations cease to be valid when one shifts focus from a Class I unit to a Class III unit.

**Comment:** The revised regulations fail to make provision for waste management units that are conducting ground water monitoring under existing Waste Discharge Requirements. [36I]

**Response:** In response to this comment, the regulations have been changed by the addition of Subsection 2550.0(f), which provides a grace period for submission of an update proposal and provides the regional board with an appropriate grace period to implement such proposals by updating the waste discharge requirements.

**Comment:** This section is not clear regarding the revised article's applicability to sites that have ceased operating prior to the effective date the of article. [30J,30S] The revised regulations lack any "grand-father" provision or phased-in compliance schedule for waste management units that: 1) have already received Part B permits; 2) newly obtain interim status, or; 3) are currently operating under interim status. [30K] The regulations should provide a three-year grace period during which units that were in compliance with repealed Article 5 can achieve compliance with the revised article after its promulgation. [30T] All corrective action at interim status units should be deferred until the issuance of a facility permit. [30V]

**Response:** In response to these comments, the regulations of this section have been modified as follows. New Subsection (f) provides a grace period following promulgation of this article so that existing units can come into compliance with its provisions. In addition, Subsections (a) and (b) of this section have been modified to make mandatory the application of this article to Class I units that have received hazardous waste after July 26, 1982. Chapter 15 does not recognize interim status under the USEPA regulations; therefore, revised Article 5 subjects all units to the same set of requirements, including all monitoring and response programs under the revised article.

**Comment:** The revised regulations do not provide for waiving Waste Discharge Requirements pursuant to Section 13269 of the Water Code. [30M,30W]

**Response:** The regulations were not changed in response to this comment because the referenced portion of the Water Code does not need to be repeated within the revised regulations in order to be applicable. The regional board may grant such a waiver, pursuant to WC 13269, if it finds that the waste being discharged to the unit does not pose a threat to human health or the environment.

**Subsection 2550.0(a)**

The applicability of revised Article 5 is consistent with the applicability under Chapter 15. This subsection retains the applicability set forth under 23 CCR Subsection 2550(a), with the exception that the regional board discretion under Subsection 2510(g) of this chapter does not apply to units which would be classified as "regulated units" under 40 CFR 264.90.

**Comments on Subsection 2550.0(a):**

**Comment:** To be consistent with the format of revised Article 5 the second sentence should read "...shall comply with the provisions of this article for purposes of detecting, evaluating, and correcting releases from waste management units." [41C]

**Response:** The regulations were not changed in response to this comment because the wording is consistent with the title of the article and is descriptive of the series of actions that a discharger is required to take. From an overall perspective, the purpose of monitoring, initially, is to detect a release. If a release is detected, the programmatic response consists of characterizing the nature and extent of the release and then implementing effective corrective action measures to clean up the affected waters.

**Comment:** This subsection reads as if releases will occur from all waste management units. Based upon our technical judgement and monitoring records this assumption is unwarranted. [18G,25G]

**Response:** The regulations were not changed in response to this comment because the wording of this subsection implies no assumption of leakage, but rather states that each unit must be

able to detect any release [should one occur] and respond to the release by first characterizing it and then developing and implementing appropriate corrective actions. Considering the potential damage to human health or the environment that can result from a release, it would be imprudent to write regulations which assume that waste management units will not leak. The best course of action is to site, design, and construct each unit so that a release is very unlikely, and then monitor the unit as a continual validation that this design intent is being fulfilled.

**Comment:** The wording of this subsection reflects neither the applicability of this chapter, under Section 2510, nor the cutoff date of July 26, 1982 that the federal regulations apply to Class I units. [31A,36D,36H] The federal cutoff date should be retained. [30C,30L,30U]

**Response:** In response to this comment, Subsection 2550.0(a) has been reworded to provide both a more obvious harmony between the applicability of the revised article and the applicability of this chapter. In addition, the wording has been changed to establish equivalency with the federal cutoff date by making the application of the article mandatory for units that have received hazardous waste after July 26, 1982.

**Comment:** For clarity, this paragraph should identify which types of releases the discharger must respond to. The end of the second sentence should read "...responding to releases of hazardous constituents from waste management units to the ground water, surface water, or the unsaturated zone." [27A54b]

**Response:** In response to this comment, the end of the second sentence has been amended as follows: "...responding to releases to ground water, surface water, or the unsaturated zone." The phrase "of hazardous constituents" was omitted because, in California, a discharger must respond to all releases from a waste management unit, not only releases of hazardous constituents.

**Comment:** The first sentence should be revised to read "....owners and operators...". [41A]

**Response:** The regulations were not changed in response to this comment for the following reasons. The wording of this phrase is derived from the corresponding federal wording under

40 CFR 264.90(a). For purposes of demonstrating equivalency with the federal regulations, the federal wording is retained to the maximum extent feasible. In addition, the use of the word "and" in this context could be interpreted to require that the subject person be both the owner and the operator, when in fact the regulations are applicable to an operator, an owner, or a person who is both the owner and the operator.

**Comment:** The definition of the term "waste management unit" in Article 10 is broader than that used in this subsection. The parenthetic expression of this term should be deleted. If a definition must be used in this section it should occur after the first use, not in the second use, of the term. [41B]

**Response:** The regulations were not changed in response to this comment for the following reasons. The use of this language parallels the use of the corresponding federal language in 40 CFR 264.90(a)(2). For demonstrating equivalency with the federal regulations, this wording remains unchanged. This usage is not contrary to the meaning of the term under Article 10.

**Subsection 2550.0(b)**

Even though lined waste management units sited and constructed in accordance with Article 4 of this chapter are designed not to leak, the occurrence of a release is nevertheless reasonably foreseeable. Given that this is the case, it is essential that any discharger seeking to operate a classified waste management unit be capable of providing adequate corrective action in the event of a foreseeable release. Section 13263 of the Water Code provides the regional board with the power to write Waste Discharge Requirements, which are essentially conditions placed upon the discharge. In light of the damage that a release can inflict upon the waters it affects, it is reasonable for the regional board to require that a discharger provide financial assurances that the discharger can complete corrective action for any reasonably foreseeable release.

**Comments on Subsection 2550.0(b):**

**Comment:** The words "at the facility" should be deleted from the end of this subsection. They are unnecessary and "facility" is not defined. [41E]

**Response:** The regulations were changed in accordance with this comment.

**Comment:** The requirement to provide "assurances of financial responsibility for corrective action for all releases from any waste management unit at the facility" is vague as to when such assurances are to be provided and in what form. This requirement should either be dropped or the specific form and timing of the financial assurance should be provided within the regulation. A good starting point would be to adopt requirements consistent with the proposed federal requirements for Subtitle C [dated 21 October, 1986] and for Subtitle D [dated 30 August, 1988], as well as those mechanisms authorized under Section 66264.151 of Article 8 of Title 22. [18H,25H,41D,42B,52B]

**Response:** The regulations were not changed in response to this comment for the following reasons, with regard to the form of financial assurance the regional board will accept. The degree of assurance that the regional board would require under this subsection will depend upon the degree of threat that the site poses and upon the anticipated difficulty of remedial action. In the past, regional boards have accepted assurances of financial responsibility in a wide variety of forms in order to make it easier for dischargers to accommodate the requirement for assurances of financial responsibility within their individual financial constraints. Regional boards should have the flexibility to allow dischargers to integrate their financial commitments for closure and post-closure maintenance, under Subsection 2580(f) of Article 8 of this chapter, with their other financial obligations for waste management and environmental protection. Subsection 2580(f) is not restrictive as to the form of financial assurance needed for closure and post-closure maintenance. Dischargers who own or operate facilities for treatment, storage, or disposal of hazardous waste are required to demonstrate financial responsibility using instruments that conform to very detailed specifications contained in the Minimum Standards for Management of Hazardous and Extremely Hazardous Wastes promulgated by the Department of Health Services [Chapter 30, commencing with Section 66264.151, of Division 4.5 of Title 22 of the California Code of Regulations, see Article 8, Financial Requirements, 22 C.C.R. 66264.140, et seq.]. Under existing laws, dischargers who operate solid waste landfills are required to provide assurances of financial responsibility for closure and post-closure maintenance. Revised amendments to these laws (AB 3651, Eastin) would make the requirements in the Department of Health Services' hazardous waste regulations

applicable to disposal sites for non-hazardous waste as well. With so many satisfactory models of financial assurance instruments available to dischargers and regional boards, further specificity in the State Board's monitoring regulations is not needed.

The wording of this subsection has been changed in response to the portion of this comment that addresses the time when financial assurances are required of the various waste management units to which this article applies.

**Comment:** The revised regulations go beyond current Chapter 15 by requiring Class II and Class III facilities to meet financial responsibility requirements for corrective action. [23G,36J]

**Response:** The revised regulations were not changed in response to this comment for the following reasons. Existing regulations in Chapter 15 require that, at a minimum, the discharger provide assurances of financial responsibility for the cost of closure and post-closure maintenance. Regional boards have required additional assurances of financial responsibility for potential cleanup and abatement activities as a matter of course. For example, Region 5 required Homestake's McLaughlin Mine to provide a substantial contingency fund requirement for pollution as well as closure. Therefore, this incremental increase in the regulatory burden associated with discharges of waste to land is necessary to provide for future compliance with substantive requirements in the event that remedial action is needed to achieve such compliance. A regional board is not exercising good stewardship if it permits a discharger to operate who could not afford to clean up a release from the discharger's unit. All units have the potential to leak, even though they are designed with the intention of not leaking. If a discharger cannot afford to clean up a reasonably foreseeable release, then that discharger should not be permitted to operate because, in the event of a release from such a unit, the cost of the corrective action will be borne by the public. It is not reasonable to obligate the public for the convenience of a private, profit-making venture. The Water Code authorizes the regional board to set requirements for discharges and to require the discharger to establish capability for compliance with these requirements. In the case of a discharge of waste to land, a discharger remains responsible for compliance with the requirements of this article for as long as the discharged waste could affect the quality of the waters of the State. During this time, the regional board should ensure that the discharger has, and will have, the

financial resources necessary to remedy any condition of pollution or nuisance that can be anticipated as a result of the discharge.

Comment: This subsection should require financial responsibility for completing corrective action for all releases. The word "completing" should be inserted before the phrase "corrective action". [27A63]

Response: The regulations have been changed in accordance with this comment.

Subsection 2550.0(c)

This subsection has been reworded to more clearly indicate that it, in conjunction with Section 2550.12 of this article, provides for the cleanup of discharges of waste that have occurred at locations within a Class I facility that do not qualify as waste management units [e.g., habitual spill sites]. Any person discharging or proposing to discharge wastes which could affect the quality of surface or ground waters of the State is required to file a report of waste discharge with the appropriate regional board [WC 13260]. The regional board uses this information to evaluate the nature and possible water quality consequences of the discharge and to prescribe Waste Discharge Requirements. Habitual spill sites, for example, do not receive this sort of focus yet they can represent a considerable threat to human health and the environment because the total volume of waste discharged can be considerable and because they cannot be monitored or corrected unless their existence is known. However, if such a problem area is found, there remains the difficulty of how to apply monitoring and response programs to it which were designed to be used with properly constructed waste management units. Once waste constituents are released to the environment, a threat to water quality exists. Therefore, it is necessary to ensure that, at a minimum, corrective action is instituted to protect human health and the environment [including the beneficial uses of waters of the State] at all discharge locations at a facility with a Class I unit, even at those locations which do not qualify as waste management units. This provision enables the selective application of cleanup and monitoring technology to such sites. Ongoing monitoring [e.g., a Detection Monitoring Program] would be inappropriate for such a site because it is not a properly constructed waste management unit from which a release might occur -- a discharge other than



to a waste management unit is a release. This subsection is based on the requirement in 40 CFR 264.90(a)(2) that all "Solid Waste Management Units" must comply with 40 CFR 264.101, which corresponds to Section 2550.12 of this article.

**Comments on Subsection 2550.0(c):**

**Comment:** Change this subsection to read: "...All owners and operators of solid waste management units shall comply...with ...Section 2550.1.... The discharger shall comply with...Section 2550.1...."[41F]

**Response:** The wording of this subsection has been clarified to make the discharger, rather than the unit, responsible for the release. However, the reference to Section 2550.12 is retained because that is the appropriate section, not Section 2550.1.

**Comment:** The provisions under Subsection 2550.0(c) and Section 2550.12 regarding corrective action at solid waste management units are internally inconsistent and redundant and should be deleted.[36K]

**Response:** The regulations were not changed in response to this comment because the cited portions of the revised article are necessary for purposes of achieving equivalency with their corresponding requirements in the federal regulations [Subsection 264.90(a)(2) and Section 264.101 of 40 CFR Subpart F], from which they are derived in form, content, and application.

**Comment:** Subsection (c) refers to revised Section 2550.12. As noted elsewhere [see comment 23B in this document under Section 2550.12], it is unclear whether this pertains only to hazardous waste facilities. If so, there is further confusion in this section.[23H]

**Response:** In response to this comment, both Subsection (c) of this section and Section 2550.12 have been revised to clarify that they apply only to waste management facilities which have received hazardous waste.

**Subsection 2550.0(d)**

This subsection is needed to clearly state that any of the monitoring and response programs [i.e., Detection, Evaluation, Corrective action] may be required during either a post-closure maintenance period or a compliance period because the monitoring and response program to be instituted at a waste management unit should be appropriate for the conditions at the site. For example, if a release has been cleaned up such that the Corrective Action Program has been terminated prior to the end of the compliance period, monitoring at the waste management unit should then be focussed in a detection monitoring mode, even though the compliance period has not ended, for the purposes of detecting any new release from the unit. Under Subpart F, only a Compliance Monitoring Program or a Corrective Action Program is implemented during a compliance period because of the different focus of the federal monitoring and response approach. The requirements of this subsection are consistent with the State approach wherein the Evaluation Monitoring and Corrective Action Programs serve only in response to the discovery of a release during a Detection Monitoring Program, as discussed in the introduction to this Statement of Reasons.

**Comment on Subsection 2550.0(d):**

**Comment:** This subsection should be revised to read "The regulations...apply during the active life and the closure period of the waste management unit. After the closure period...."[41G]

**Response:** The regulations were not changed in response to this comment because the wording used in the revised regulations is sufficiently clear and because the commentor provides no reasoning to support the proposed change.

**Subsection 2550.0(d)(1)**

This subsection provides for a minimum three year clean period in cases where the discharger has completed a clean closure of a unit and wishes the unit to cease conducting monitoring and response programs. This requirement for three clean years is necessary to assure that the discharger cannot escape responsibility for a previously undetected release from the unit. Although the length of this clean period is somewhat arbitrary, considering the varying site conditions to which it will be applied, it should be noted that both the federal regulations [40 CFR 264.96(c)] and the revised article [Subsection 2550.6(c)]

require an equivalent three-year clean period in cases where a corrective action program has caused the length of the compliance period to be extended. The three year duration of this proof period is therefore a reasonable minimum under conditions where a release may have occurred without as yet being detected.

**Subsection 2550.0(d)(2)**

Under revised Article 5, water quality monitoring is required unless the waste that has been discharged to the waste management unit no longer poses a threat to water quality. Monitoring is not required after closure if all constituents and materials which would threaten water quality are removed or treated such that they do not pose a threat. This subsection represents a non-substantial change from repealed 23 CCR Subsection 2550(d).

**Comments on Subsection 2550.0(d)(2)**

**Comment:** The requirement to remove all contaminated ground water will effectively eliminate clean closure. [28F,31C,35B] The requirement under Subsection 2550.0(b) to clean up ground water prior to being able to achieve "clean closure" should be eliminated because the clean closure of a leaking unit is one of the best ways to assure that additional releases to ground water will not occur. [32A]

**Response:** In response to these comments, the regulation has been changed to eliminate the requirement that all contaminated ground water be removed for purposes of clean closure. However, this does not preclude the regional board from requiring monitoring and corrective action as necessary to address a release that is discovered prior to completion of the clean closure. The article will still apply to such a unit until the corrective action is completed and the unit is no longer within a compliance period.

**Subsection 2550.0(e)**

For Class I waste management units, this provision is necessary to ensure that alternatives are not approved which are inconsistent with the requirements set forth under Subpart F. In like manner, this article was drafted with the goal of providing a monitoring and response program approach that is appropriate for all classes of waste management unit, with additional class-specific provisions being added only where necessary to provide additional stringency. The revised article contains adequate

flexibility to provide workable monitoring and response programs that are custom tailored to the conditions of each waste management unit. Therefore, it is not reasonable to provide for alternative approaches.

**Comment on Subsection 2550.0(e):**

**Comment:** The SOR for this subsection refers only to hazardous waste units. It should be revised to address non-hazardous waste facilities. [231]

**Response:** In response to this comment, the Statement of Reasons for this subsection has been expanded to justify the applicability of this subsection to all classes of waste management unit.

**Subsection 2550.0(f)**

This subsection is essential for providing the dischargers and regional boards with a time framework within which to bring all monitoring and response programs into compliance with the revised article, subsequent to its promulgation.

**Comments on Subsection 2550.0(f):**

**Comment:** The wording of this subsection appears to be too broad because its application would include Class I waste management units that have undergone RCRA closure and are already in compliance with the RCRA regulations. Waste discharge requirements for such units should not be forced to go through another round of revisions. [64A]

**Response:** The regulations were not changed in response to this comment for the following reasons. If the waste discharge requirements for a unit are in compliance with current RCRA regulations then little additional changes should be necessary to bring the unit into compliance with revised Article 5 because the two sets of regulations are very similar. However, unlike the federal regulations, Chapter 15 requires monitoring of the unsaturated zone and of surface water, so additional monitoring in these areas would be required if the unit were not already so monitored. If a unit is closed in place (still containing hazardous waste), a release from the unit is a possibility that cannot be ignored and there is no reason to permit it to be

monitored with any less stringency than would be applied to a Class I unit that is still receiving waste.

**Comment:** The processing time frames stated in this subsection may not be compatible with the closure plan requirements of Government Code Section 66796.22. [59C]

**Response:** The regulations were not changed in response to this comment because Subsection (f) does not address closure plans but rather provides a phase-in time for all dischargers subject to the revised regulations. This subsection does not, therefore, conflict with any closure plan requirements.

**Comment:** The revised language requires that the regional boards revise all waste discharge requirements within two years of the effective date of the article, but does not include the time-frames for the regional board to evaluate and approve an individual submittal. This does not address the requirements of the Permit Reform Act of 1981 [Government Code Sections 15374, et seq.] or the Development Permit Act [Government Code Sections 65920, et seq.]. [59D, 68C{page 2}]

**Response:** The proposed regulations were not modified in response to comments regarding the Permit Reform Act of 1981 (Government Code 15347, et seq) and the Development Permit Act (also known as the Permit Streamlining Act, Government Code 65920, et seq) because the procedure for updating dischargers' monitoring programs to comply with the proposed regulations does not constitute a permit application subject to the provisions of these statutes. Monitoring programs are imposed on dischargers as a condition of being allowed to discharge wastes that could affect the quality of the waters of the State in conjunction with other permitted activities. The issuance of waste discharge requirements following the submittal of a complete report of waste discharge is subject to these provisions, but modification of the dischargers' self-monitoring requirements is not.

The permit Reform Act of 1981 and the Development Permit Act impose certain requirements on public agencies that process applications for permits governing a wide range of projects, including the State Board and the Regional Boards.

The Permit Reform Act requires public agencies to specify, in regulations, the time needed to determine that a permit application is complete, the time needed for a final decision on

the permit once the application is complete, and the range of actual performance during the prior two years. The Development Permit Act supersedes the general requirements of the Permit Reform Act by providing specific time limits for the determination of the completeness of an application for a development permit (30 days).

In addition, Water Code 13264 provides that dischargers may begin their discharges if the regional board fails to process a report of waste discharge and issue waste discharge requirements within 120 days after the report has been accepted as complete (subject to such requirements as the regional board may ultimately adopt).

The State Board has responded to these statutory requirements by adopting regulations codified in Title 23 of the California Code of Regulations, at Sections 2205 to 2208.

**Comment:** Thirty days is not enough time after regional board approval for the average discharger to begin construction. Instead the discharger should be required to submit a schedule for implementing any necessary construction within 30 days of regional board approval of the proposed programs. [55A]

**Response:** The regulations were not changed in response to this comment for the following reasons. Undue delay in bringing the unit into compliance with this article would result in taking a risk that a release, if present, would not be detected at the earliest possible time; therefore, a time limit for initiating construction is necessary in order to protect the waters of the State. The 30-day response time in this subsection provides a reasonable balance between the two opposing factors of water quality protection, which necessitates prompt action, versus the difficulty of making arrangements for construction, which is made easier by a long lead time. One factor tending to ease the potential inconvenience of a prompt initiation of construction is that the discharger is fully aware of the construction steps necessary because it is the discharger who initiates the revised monitoring plan containing those construction steps; therefore, the discharger can accomplish many of the initial preparation steps for construction prior to regional board approval.

**Comment:** The regulations should include a more extended phase-in period than six months, especially for waste management units which have just had their waste discharge requirements recently issued or revised. [56D, 58B] In addition, the May 6, 1990 version

of the regulations do not include any limitation on the part of the regional board for acting upon the many proposals that will come in. The State Board's June 6 and 7, 1990, agenda item No. 3 indicates that "this activity is budgeted with existing resources". It is questionable if regional boards have allocated sufficient resources to be able to promptly respond to the deluge of submittals that will occur over the first six months after the effective date of this article. Therefore, a more reasonable approach would be to require dischargers to submit revised monitoring plans as part of future revisions to existing waste discharge requirements, but in any event, not more than five years from the effective date of the regulations. [56D] Implementation of the plan should not be required until 30 days after the regional board has approved it. [58B]

Response: The regulations were changed in response to this comment by providing a required regional board response time of one year after submittals from owners or operators of Class I units and two years after submittals from owners or operators of Class II and Class III units. In addition, the regulations were changed to increase the phase-in time for owners or operators of Class II or Class III units from six months to a full year after the effective date of the article. These time frames were chosen because they represent a reasonable balance between the time frame required for implementation and the potential damage that could result from unnecessary delays.

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Section 2550.1. Required Programs.Specific Purpose

The specific purpose of this section is to ensure that the discharger conducts appropriate monitoring and response programs at each waste management unit, to provide that minimum standards for each program are implemented through Waste Discharge Requirements, and to establish the conditions under which each of these programs are required to be instituted.

Factual BasisSubsection 2550.1(a)

As discussed in the introduction, it is necessary to employ water quality monitoring and response programs at waste management units because of the potential for migration of wastes from each unit. Water quality monitoring is required because it provides the most reliable early warning of releases; it provides the most appropriate means available to evaluate the effects of releases on waters of the State and to determine the necessary responses; and it provides the most effective means available to determine the effectiveness of remedial actions. The type and degree of monitoring implemented at a waste management unit must, at a minimum, be appropriate for accomplishing these monitoring objectives in order to adequately protect human health and the environment.

Comments on Subsection 2550.1(a):

Comment: This subsection should be revised to read "A discharger subject to this article shall conduct a detection monitoring, evaluation monitoring, or corrective action program for each...."[41H]

Response: The regulations were not changed in response to this comment because the revised wording of this section provides the desired meaning. Namely, that if no other programs are in affect, then a Detection Monitoring Program must be instituted, but that a Detection Monitoring Program should also be run concurrently with other programs [i.e., Evaluation and Corrective Action] at a waste management unit whenever portions of the unit are left unaddressed by the other programs. Therefore, it is not



simply a matter of choosing which single program the unit will be under, but rather of choosing the best combination of programs under the circumstances.

**Comment:** This section should reflect the specific components of the program for clarity, by specifying that a discharger subject to this article "shall conduct a detection monitoring program, an evaluation monitoring program and/or a corrective action program for each waste management unit at the facility as follows:...."[18I,25I]

**Response:** The regulations were not changed in response to this comment because the detection, evaluation and corrective action programs are not components of the program, they are the monitoring and response programs. One or more of these monitoring and response programs will be active at each waste management unit until either the end of the post closure maintenance period or until the end of any compliance period, whichever is later.

**Comment:** For clarity, this subsection should identify in what instances the discharger must conduct monitoring and response programs and the phrase "for ground water, surface water, and the unsaturated zone" should be added after "for each waste management unit".[27A54c]

**Response:** The regulations were not changed in response to this comment because the suggested wording would give a false impression that a separate monitoring program is required for each medium. In the revised regulations the word "program" has been used to refer to all water quality monitoring activities involved in either detecting a release, evaluating a release, or performing corrective action.

**Subsection 2550.1(a)(1)**

A detection monitoring program must be instituted in order to alert responsible agencies as soon as possible if a release from a waste management unit occurs. This requirement represents a non-substantial change from repealed 23 CCR Subsection 2551(a)(1), and it conforms to the corresponding requirement for instituting a detection monitoring program under 40 CFR 264.91(a)(4).

**Comment on Subsection 2550.1(a)(1):**

**Comment:** Subsection (a)(1) of this section is unclear on whether operators that are conducting an evaluation monitoring program or a corrective action program must continue their detection monitoring program. Suspending a detection monitoring program after a release is found can result in additional releases going undetected. The regulations should expressly state in Sections 2550.1, 2550.9, and 2550.10 that operators subject to Article 5 have a continuing obligation to maintain detection monitoring program at all times, and should specifically include periods of investigation or cleanup. [46M]

**Response:** The regulations were not changed in response to this comment because it is not the purpose of Subsection 2550.1(a)(1) to specify an ongoing Detection Monitoring Program. However, Subsection 2550.1(c) clearly states that a detection monitoring program shall be continued as necessary to provide for the detection of new releases from those portions of the unit that are not monitored by other programs active at the unit.

**Subsection 2550.1(a)(2)**

A detected release from a waste management unit indicates that either pollution is occurring or that a threat to water quality exists. Subsequent to discovering that a release has occurred, a more intense and focussed monitoring effort is necessary to determine the extent and magnitude of the problem and to determine what the appropriate remedial action should be. Early evaluation of a release allows for corrective action measures to be instituted in order to minimize or even prevent degradation of ground water and surface water bodies. When a release is detected in the unsaturated zone, it can be responded to before it reaches ground water. If the extent of a problem is determined as soon as possible, corrective action can be implemented to prevent the loss of beneficial uses of the affected waters. Thus, a timely response to assessing the problem can minimize the necessary costs and disruptions of corrective action measures and provides more effective protection to public health and the environment. This requirement represents a non-substantial change from repealed 23 CCR 2551(a)(2) and is consistent with 40 CFR 264.91(a)(1) to the extent that a more intense level of monitoring is required as a response to a detected release; however, the focus of the federal Compliance Monitoring Program is different than the focus

of the revised Evaluation Monitoring program [as described in the introduction to this Statement of Reasons].

**Subsection 2550.1(a)(3)**

Water quality monitoring is not the only means of providing an early indication of a release from a waste management unit. Physical conditions can exist at or in the area surrounding a waste management unit that provide a quantifiable indication that a release has occurred. It is reasonable to assume that these types of conditions represent an indication of a release and, therefore, that the unit is posing a threat to human health and the environment. Such indications may precede detection of leakage by the detection monitoring system or may even be the only indication of leakage if the monitoring network has been circumvented or breached by unanticipated migration paths. Therefore, under these conditions, it is necessary to institute an Evaluation Monitoring Program in order to assess the nature and extent of the problem. This requirement is imposed in order to adequately protect water quality; it is consistent with WC 13267.

**Comments on Subsection 2550.1(a)(3):**

**Comment:** It is not clear how a triggering mechanism based on "unexplained stress in biological communities" (among other things) would be implemented, because the regulatory language is geographically unbounded, does not recognize that biological communities are in stress as a rule, and seems to attribute the presence of a waste management unit as the sole cause of any physical or biological perturbation in its vicinity. [18J,25J, 31D,36L] This subsection should be revised to allow the discharger an opportunity, prior to being forced into evaluation monitoring, to show that the physical evidence is unrelated to the unit.[36L] This general requirement is too vague. It appears that a facility could be forced into a costly "Evaluation Monitoring Program" even if it passed the statistical tests. The last sentence should add that the types of physical evidence and visible changes in the environment should be agreed to in the WDRs by both the discharger and the state. Otherwise, this section gives too much discretion to the State.[56L]

**Response:** The regulations were not changed in response to this comment for the following reasons. As a safeguard, the first sentence of this subsection moderates the application because the physical evidence must be "significant", giving reasonable assurance that only an untoward occurrence could serve to trigger

an evaluation. This protects the discharger from being forced to investigate odd physical occurrences which, because they occur at considerable distance from the unit or are typical of natural variation in the area, are not likely to have been the result of a release from the unit.

On the other hand, there can be no doubt that the named triggering mechanisms can be valid indications that a release has occurred. If an indication of a release becomes evident as a result of statistical analysis from monitoring point data, then both the discharger and the regional board will have the information necessary to substantiate a proposal under Subsection 2550.8(k)(7) that the release did not result from the unit, based upon knowledge of the hydrogeology underlying the unit and any additional information that the discharger can bring to light. Subsection 2550.8(k)(7) presumes that hydrogeologic information about the site can be relied upon to provide an accurate model for the fate and transport characteristics of a release. The basis for both the demonstration and the review of that demonstration is that each monitoring point has been chosen with specific regard to an agreed-upon model of the hydrogeology underlying the site. However, such knowledge is unlikely to be available where the release is indicated by "significant physical evidence" because, by not having indicated a release, the monitoring point system and its attendant model are both suspect and can therefore not be used to disprove the indication. The lack of indication by the monitoring point system may be because the monitoring points are improperly placed and the release has bypassed all the monitoring points [i.e., the hydrogeologic model is wrong], or because the release has not as yet migrated to any of the monitoring points, or it may be that the physical evidence has no relation to the unit. In any case, both the discharger and the regional board will be without an adequate basis to evaluate the cause of the perturbation. Only through the implementation of an evaluation monitoring program to investigate the cause of this phenomenon can the issue be resolved. Once adequate information has been gathered through the Evaluation Monitoring Program to pinpoint the cause of the physical evidence, the discharger is prepared to either proceed on to corrective action [i.e., there is a release] or to return to detection monitoring, pursuant to Subsection 2550.9(f), if the unit is exonerated. Under conditions which throw doubt upon the validity of the hydrogeologic model used to establish the monitoring point network, the only valid way to respond is to investigate the evidence. The move to an evaluation monitoring program, as provided in this subsection, is essential for

providing adequate protection to human health and the environment.

Subsection 2550.8(1) has also been rewritten to describe the responsibility of the discharger to notify the regional board within 7 days of determining that there is significant physical evidence of a release, and submit an amended report of waste discharge within 90 days of such determination.

**Subsection 2550.1(a)(4)**

This requirement is imposed in order to provide adequate protection to public health and the environment by providing for timely corrective action because degradation of waters of the State can be prevented or minimized when appropriate corrective action is taken as soon as possible after the detection of a release. A timely response can minimize the necessary costs and disruptions of corrective action measures. This requirement represents a clarification of repealed

23 CCR Subsection 2551(a)(3) [in repealed Article 5] under which a corrective action program was required to be instituted when the water quality protection standards [water quality background values] were exceeded [i.e., the presence of a release from a waste management unit was verified].

**Comments on Subsection 2550.1(a)(4):**

**Comment:** Subsection 2550.1(a)(4) fails to state clearly when corrective action is required. [36M]

**Response:** The regulations were not changed in response to this comment because the subject Subsection clearly states that the discharger is to begin the corrective action when the regional board approves the amended Report of Waste Discharge [ROWD] submitted to the regional board. This starting time is quite clear, and the discharger will be prepared to begin the program because it is the discharger who submits the plan for the corrective action, as part of the amended Report of Waste Discharge. In cases where the discharger's plan is unacceptable to the regional board, the regional board can either call for a revised submittal or can revise the plan and then adopt the revised version.

**Comment:** For clarity, this subsection should better identify the purpose of the amended Report of Waste Discharge. [27A54d]

**Response:** The regulations have been changed in response to this comment to clarify that the amended Report of Waste Discharge is submitted for the purpose of instituting a Corrective Action Program.

**Subsection 2550.1(b)**

More than one monitoring program may be necessary at a waste management unit. In some cases, site conditions can present a serious immediate threat to water quality; thus, a delay in instituting a particular program could pose or increase a threat to human health or the environment.

Because administrative processes to modify waste discharge requirements can cause delay in implementing an effective response to a release, having an Evaluation Monitoring Program in the Waste Discharge Requirements prior to leak detection can expedite the implementation of an appropriate investigation. This subsection represents a non-substantial change from repealed 23 CCR Subsection 2551(b). The specific language of this subsection also conforms to the corresponding Subpart F language in 40 CFR 264.91(b). This subsection conforms to the federal section as described in Volume 47 of the Federal Register, at page 32293, Monday, July 26, 1982 [47 FR <32293-32295>], except that the revised regulations do not provide for shifting between programs. Under Subpart F, a waste management unit may shift back and forth between the compliance monitoring mode and the corrective action mode of monitoring as the concentrations of hazardous constituents in ground water fluctuate above and below the concentration limits in the federal ground water protection standard. As discussed in the introduction to this Statement of Reasons, the focus of the revised Evaluation Monitoring Program is different than the focus of the federal Compliance Monitoring Program. Because of this difference, shifting back and forth between programs, as provided for in Subpart F, is not appropriate. Also, under the revised regulations, the goal of corrective action is to restore water quality, to the greatest extent feasible, to the conditions that existed prior to any release. Therefore, the waste management unit must remain in the corrective action mode until compliance with the Water Quality Protection Standard [Standard] is achieved with a degree of certainty that fluctuations of concentrations of constituents have reached equilibrium.

**Comments on Subsection 2550.1(b):**

**Comment:** The term "specific elements" should be further defined in the first sentence. [41I]

**Response:** The regulations were not changed in response to this comment because the required specific elements of each monitoring and response program are listed in its respective section [Section 2550.8 for a Detection Monitoring Program, Section 2550.9 for an Evaluation Monitoring Program, and Section 2550.10 for a Corrective Action Program].

**Comment:** The term "monitoring and response plan" should be modified to state the specific programs involved. [41J]

**Response:** The regulations were not changed in response to this comment because this subsection does not contain the subject phrase. If the commentor meant instead the phrase "monitoring and response program" [end of the first sentence], then please refer to the response to comment 41H, in the portion of this Statement of Reasons which addresses Subsection (a) of this section.

**Comment:** The third sentence may be unnecessary because the regional board always considers the potential effects on human health and the environment. [41K]

**Response:** The regulations were not changed in response to this comment because the subject sentence requires this consideration in the specific context of the additional threat to human health and the environment that could occur due to the administrative delay necessary to craft a new program subsequent to a release. This sentence is needed for clarity.

**Subsection 2550.1(c)**

After a release from a waste management unit has been detected, waste contained in the unit continues to represent a potential threat to human health and the environment. Evaluation monitoring and corrective action programs are specifically focussed on the detected release; thus, it is necessary to continue to conduct detection monitoring at those monitoring

points that are not involved in the other programs to provide early warning of migration of wastes that may occur from other locations at the unit. This requirement is consistent with revised Subsection 2550.1(b) and is imposed in order to adequately protect human health and the environment. This requirement is consistent with the monitoring that would be required under Subpart F after hazardous constituents are detected in ground water, because under the federal Compliance Monitoring Program [40 CFR 264.99] monitoring for purposes of detecting "increased contamination" is conducted at all monitoring points at the regulated unit. Therefore, this type of monitoring can also provide for detecting subsequent releases. Under the revised article, however, the only monitoring points that are carried over to the evaluation and corrective action are those which are immediately affected by the release or which are instrumental-addressing the release. Therefore, the remaining monitoring points should be kept in detection monitoring mode in case another release occurs which is manifested outside of the suite of monitoring points carried over to evaluation or corrective action for the initial release. Therefore, Detection monitoring imposed under this subsection provides protection of human health and the environment after a release has been detected and provides functional equivalency with the monitoring that would be required at Class I units under Subpart F.

Comments on Subsection 2550.1(c):

Comment: It is not clear from the wording of this subsection that detection monitoring will be continued at all monitoring points not included in the evaluation monitoring or corrective action programs. [18K,25K] The wording of this subsection appears to imply that potentially redundant monitoring programs could be required. [36N]

Response: The regulations were not changed in response to these comments for the following reasons. Those monitoring points which are involved in delineating a release under an evaluation monitoring program or in monitoring the effectiveness of a corrective action program are not suited to the detection of subsequent releases from the units because at such monitoring points it will not be possible to distinguish a new release from the release being monitored. Therefore, this subsection can only apply to monitoring points which are not affected by the release, including all viable monitoring points that have not been included under another program. The subsection does not



specifically require that every monitoring point left out of the other programs be included, because there are instances in which a poorly installed, aged, or otherwise poorly-performing monitoring point should be retired or replaced. The wording of this subsection permits such practical adjustments while still enabling the development of an effective detection monitoring program in those portions of the unit that are unaffected by the release. This is good regulatory approach. Just because a unit has a release from one part of its containment structure does not preclude the possibility of a separate release from another part of the unit.

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**Section 2550.2. Water Quality Protection Standard.****Specific Purpose**

The specific purpose of this section is to establish a standard for protecting water quality that provides for the detection of waste constituents, and known reaction products of waste constituents, that can be released from a waste management unit and that provides for the determination of successful corrective action.

**Factual Basis**

It is necessary to establish baseline conditions under which monitoring must be conducted in order to provide adequate protection for human health and the environment. This section is based on 40 CFR 264.92 [also see 47 FR <32295>]. The proposed Water Quality Protection Standard [Standard] is not limited to protecting ground water. As discussed in the introduction to this Statement of Reasons, the California approach to protecting all waters of the State is retained under revised Article 5; therefore, the Standard is directed to surface water and soil-pore liquid in the unsaturated zone which can be affected by a release from a waste management unit as well as to ground water in the uppermost aquifer and other aquifers that could be affected by a release from the unit. This provides for detection of a release at the earliest possible opportunity.

Also, the proposed Standard will apply during the entire active life of the waste management unit and after closure of the unit, unless a variance to monitoring is granted [as the result of a successful clean closure], as well as during any compliance period.

Under Subpart F, the federal standard applies only during the compliance period, which begins after hazardous constituents have been detected in ground water [when a compliance monitoring program is instituted]. As discussed in the introduction, it is necessary to monitor periodically for the "Constituents of Concern" at a waste management unit prior to any release occurring in order to acquire the water quality data necessary to evaluate the effectiveness of indicators [i.e., the Monitoring Parameters] being monitored on a more frequent basis. This monitoring reasonably ensures that the objective of the detection monitoring program is being accomplished. It is necessary to make this evaluation before "hazardous constituents have entered the ground water" to become reasonably assured that

contamination is not occurring. Thus, the Standard is applied such that it provides protection for human health and the environment prior to any known contamination of ground water. This is consistent with statutory authority provided under the California Water Code for protecting existing water quality wherever possible.

**Comments on Section 2550.2:**

**Comment:** Establishing concentration limits for every "constituent of concern" instead of only for monitoring parameters is not necessary. Why establish concentration limits for constituents that will not necessarily be monitored for?[56M]

**Response:** The regulations were not changed in response to this comment because the monitoring parameters are only intended to act as surrogates for the constituents of concern and because the constituents of concern are monitored for at least every five years [see Subsection 2550.8(g)].

**Comment:** Under the revised regulations, the distinction between a water quality protection standard and a concentration limit is unclear.[360]

**Response:** In response to the comment, this section has been reworded to more clearly show that the concentration limits are a component of the water quality protection standard. In addition, it is clear from the way that the water quality protection standard and its constituent components are used [in the statistical provisions of Section 2550.7, and in the detection monitoring provisions under Section 2550.8] that the discharger is suspected of being in violation of the water quality protection standard if at any time the statistical test indicates that a concentration limit for any Constituent of Concern or Monitoring Parameter has been exceeded at any monitoring point. Throughout all the monitoring and response programs [Sections 2550.8 through 2550.10], the water quality protection standard is a yardstick with which the waste management unit is measured to: (1) determine if leakage has occurred [Section 2550.8], (2) determine the nature and extent of a release [Section 2550.9], or (3) determine how effectively the corrective action measures are performing in cleaning up a release [Section 2550.10].

**Comment:** For consistency, the following changes should be made in the first sentence of this section: replace "determine whether" with "ensure that"; replace "exceed" with "do not exceed". [27A54e]

**Response:** The regulations were not change in response to this comment because, for the sake of clarity, the first sentence in this section has been eliminated. Review of this requirement showed it to be confusing, because the discharger must comply with all conditions in the Waste Discharge Requirements, not just the conditions that were described in the first sentence of this section.

**Comment:** For clarity, this section should identify in what instances the regional board shall establish the water quality protection standard in the facility permit, and the phrase "for ground water, surface water, and the unsaturated zone" should be added to the last sentence. [27A55a]

**Response:** In response to this comment, the section has been reworded so that it is obvious that the water quality protection standard [Standard] is always to be included in the Waste Discharge Requirements. However, the regulations were not changed in response to the last half of this comment because to do so would have created an unnecessary redundancy; Subsection 2550.4(a) of the revised article clearly states that the Concentration Limits included in the Standard are media-specific.

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**Section 2550.3. Constituents of Concern.****Specific Purpose**

The specific purpose of this section is to establish criteria for identifying the waste constituents and reaction products for which the Water Quality Protection Standard must be established at each individual waste management unit. The term "Constituents of Concern" refers, collectively, to these constituents and reaction products.

**Factual Basis**

Releases from waste management units can have extremely adverse effects on water quality, especially when allowed to continue because they are undetected or because timely and appropriate remedial action is not taken. As discussed in the introduction to this Statement of Reasons; in order to prevent or minimize adverse effects to waters of the State, the monitoring required under revised Article 5 is focussed on detecting releases at the earliest possible opportunity, identifying the waste constituents which are released to waters of the State, and delineating the existing and projected extent of releases in order to determine the appropriate remedial response. These monitoring objectives can only be accomplished by identifying the waste constituents and reaction products that are most likely to be present in a release from a waste management unit. Monitoring for these constituents and reaction products provides a direct indication of the presence or absence of a release from the unit. The revised article uses the term "Constituents of Concern" to refer to these constituents and reaction products.

This section is also based on 40 CFR 264.93 [also see 47 FR <32295>]. It is necessary to provide the definition of the term "Constituents of Concern" in this section in addition to including it under Article 10 of Chapter 15, 23 CCR 2601 [Technical Definitions], to demonstrate equivalency with the corresponding federal regulation. In order to be consistent with the monitoring approach under Subpart F, the hazardous constituents identified under this section of revised Article 5 are based [by definition] on the list of constituents identified in Appendix IX, identified as such in 40 CFR Part 261 [which will be incorporated into DHS' revised regulations in Title 22, Environmental Health Standards for the Management of Hazardous Wastes (Division 4.5, commencing with Section 66260.1) as Appendix IX of that division]. However, under this revised

section, the criteria for identifying the Constituents of Concern is not limited to the hazardous constituents that have been detected in the uppermost aquifer underlying the waste management unit, as under the federal Section 264.93. This is because [as discussed above] the focus of the monitoring required under revised Article 5 includes the detection of a release from a waste management unit as well as the delineation and correction of releases.

Exclusions are not provided for under this revised section as they are under the corresponding federal regulations [40 FR 264.93] because, as discussed in the introduction to this Statement of Reasons, a list of indicator constituents and parameters [appropriate for the objective of the monitoring program being conducted] is specified as the list of "Monitoring Parameters" to be monitored at least semi-annually during the Detection, Evaluation, and Corrective Action monitoring programs. Monitoring for the entire list of "Constituents of Concern" is required on a less frequent basis, specified in the Waste Discharge Requirements, in order to confirm, deny, or evaluate the presence of a release; therefore, all waste constituents [hazardous and non-hazardous] and known reaction products for the waste contained in the unit must be listed as Constituents of Concern.

#### Comments on Section 2550.3:

Comment: The regulations seem to avoid considering parameters that are produced as a consequence of waste management unit releases, such as vinyl chloride (from the conversion of TCE promoted by releases of oxygen-demanding materials).  
[67M {pages: 22-23,37,38}]

Response: The regulations were not changed in response to this comment because the provisions of Section 2550.3 clearly require that the list of constituents of concern [i.e., the constituents that the discharger is responsible for cleaning up in the event of a release] include all "waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit" [emphasis added]. Therefore, in the event of a release, any chemical which is present in the water which would not have been there in the absence of a release (or which would have been present at a lower concentration) must be listed as a constituent of concern and must be cleaned up to its concentration limit.

**Comment:** The regulations propose minimum sampling requirements for Constituents of Concern only once every five years [Subsection 2550.8(g)]; this frequency should be increased. [46I]

**Response:** The regulations were not changed in response to this comment because the commentor provided neither substantiation nor rationale for the revised change. In any case, the regional board can establish a more frequent sampling for Constituents of Concern whenever it determines that this is appropriate.

**Comment:** This section seems to be directed toward hazardous waste and provides little direction for its application to units containing non-hazardous waste. This lack of direction could permit the various regional boards to develop differing applications of this section throughout the state, even in relatively similar facilities. A list of Constituents of Concern developed outside of the formal rulemaking process risk being "underground regulations". [42D]

**Response:** The regulations were not changed in response to this comment for the following reasons. This section applies to all classes of waste management unit, and neither the revised language of the regulations nor the wording of this Statement of Reasons suggests otherwise. The section clearly states in the last sentence that Constituents of Concern are the "waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit." Even Class III landfills have been known to release hazardous constituents; therefore it is clear that the wording of this section does not limit its application to Class I units. The list of Constituents of Concern developed by each regional board for each site is developed on the basis of site-specific and waste-specific characteristics and, as such, will be consistent throughout the state to the degree that the various sites and waste streams are consistent. The creation of a list of Constituents of Concern is neither a rulemaking process nor is it a set of guidelines; rather, it represents an application of the regulations to a particular site. Therefore, there is no risk of this being construed as "underground regulations".

**Comment:** The definition of Constituents of Concern in this section should exclude constituents that cannot adversely affect human health or the environment or impact beneficial uses of

waters of the State. Barring such a qualification, a master list of Constituents of Concern should be drawn up and incorporated into each Basin Plan to assure that all dischargers are subject to the same requirements. [18L,25L] The regulations should include the provision under Section 2552(a) of current Article 5 which permits the regional board to eliminate innocuous constituents from the list of Constituents of Concern. [36P] The federal language permitting the elimination of constituents from the ground water protection standard should be reinstated in this section. [30G,300,30Y]

**Response:** The regulations were not changed in response to this comment because, in the revised regulations, the State Board has proposed a new approach to selecting Monitoring Parameters that should provide the discharger and the regional board staff with the flexibility needed to design an efficient monitoring program with greater confidence than was possible under the repealed regulations. By periodically monitoring for the list of Constituents of Concern that are likely to be in or derived from waste in the waste management unit, the assumptions made during the selection of Monitoring Parameters are field verified. This approach allows the use of an abbreviated list of Monitoring Parameters that consist of only those constituents or parameters that are the most likely to provide an early indication of a release from the unit. The regulation does not provide for an exemption from the list of Constituents of Concern because that would necessarily undermine the goal of periodically testing the assumptions made in the design of the program.

In addition, the degree to which a given constituent could affect human health or impact beneficial uses is dependent upon many interacting site-specific factors such as the concentration of that constituent in the waste, the size of the release, the hydrogeologic characteristics of the materials underlying the unit, the depth to and velocity of ground water, and the likely pathway(s) of migration that a constituent would take upon being released from the unit. These site-specific factors are considered when granting a concentration limit greater than background, pursuant to Section 2550.4(c) of the revised regulations, and are based upon the investigation made under evaluation monitoring. By contrast, the similar provision under Section 2552(a) of current Article 5 is granted on the basis of much more limited knowledge during or before detection monitoring. Only by individual, site-specific consideration of each constituent can the release be analyzed with respect to its potential effects upon human health and beneficial uses.



**Comment:** The response given to WMNA and CWM's previous comments that the "constituents of concern" should be limited in some way to include only those parameters that may cause adverse environmental or human health effects, does not address the main point: If a landfill is releasing leachate to the environment, there is not going to be only one monitoring parameter that shows up in the monitoring program. The Board uses the argument that these non-problem constituents help to verify the effectiveness of the monitoring parameters in detecting a release. True constituents of concern would provide the same check. [56N]

**Response:** The regulations were not changed in response to this comment for the following reasons. The purpose of the short list of Monitoring Parameters is to act as an effective surrogate for the longer list of Constituents of Concern. This is an effort on the part of the Board to save money for the discharger and to limit the number of chances for a false-positive indication of a release. By monitoring for a well-thought-out, SHORT list of Monitoring Parameters, the discharger obviates the need to monitor on a regular basis for the many Constituents of Concern. Although monitoring for the extensive Constituent of Concern list on a regular basis would, as the commentor indicates, provide a good indication of a release from the unit, this monitoring would be prohibitively expensive and would be plagued by an extremely high rate of false-positive indications of a release. The short list of monitoring parameters provides just as good an indication of an actual release without the liabilities associated with use of the Constituents of Concern for general monitoring.

**Comment:** The revised regulations appear to require specification of hazardous constituents for Class II and III wastes even though analysis for Appendix IX constituents is required only at Class I waste management units. Constituents of Concern for Class II and Class III units should be limited to waste constituents and reaction products. [36Q]

**Response:** The regulations were not changed in response to this comment because releases from Class II and Class III waste management units often contain hazardous constituents that are either part of the nominally non-hazardous waste discharged at these units or are derived from such waste. Therefore, there is no reason to exclude hazardous constituents from the list of Constituents of Concern at such units. By the same token, however, the nominally non-hazardous waste at these units makes it unreasonable to require Appendix IX analyses subsequent to

discovering a release. The revised article provides the regional board with sufficient flexibility in such circumstances to include in the Constituents of Concern all hazardous constituents that are known or suspected to have been in or derived from the waste in the unit. This approach provides protection for the public while at the same time keeping the cost down at units accepting nominally non-hazardous waste by avoiding the costly Appendix IX analyses.

**Comment:** Section 2550.3 and Article 10 should define Constituents of Concern at a minimum as "hazardous constituents which have been detected in the ground water." The current definitions encompass many constituents other than those required in 40 CFR 264.93(a), but these additional constituents will not necessarily include those required in 40 CFR 264.93(a). Also, since Subsection 2550.8(k)(3) requires all hazardous constituents found as a result of Appendix IX sampling to be added to the list of Constituents of Concern, the original definitions of Constituents of Concern in Section 2550.3 and in the revised revisions to Article 10 must include this aspect of the term. It is suggested that the cited definitions should read:  
"Constituents of Concern are hazardous constituents that have been detected in the ground water, and waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit." [27A127]

**Response:** The definition of a Constituent of Concern has not been changed in either revised Article 5 or revised Article 10 because it does not seem appropriate to use monitoring and response requirements to address constituents that are not "reasonably expected to be in or derived from" that unit. This is consistent with the federal definition of a hazardous constituent in 40 CFR 264.93(a): "Hazardous constituents are...[hazardous constituents]...that have been detected in ground water in the uppermost aquifer underlying a regulated unit and that are reasonably expected to be in or derived from waste contained in a regulated unit, unless the Regional Administrator has excluded them under paragraph (b) of this section." [Emphasis added] However, the comment correctly identifies an inconsistency in Subsection 2550.8(k)(3) which, in response to this comment, has been modified to exclude constituents that are not reasonably expected to be in or derived from waste in the waste management unit.

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**Section 2550.4. Concentration Limits.****Specific Purpose**

The specific purpose of this section is to establish concentration limits, for the Constituents of Concern, that must be used as water quality baselines against which future monitoring results may be compared and to specify the criteria that must be used to establish each concentration limit.

**Factual Basis**

A concentration limit must be established for each Constituent of Concern in order to accomplish the objectives of each monitoring and response program. As discussed previously, the concentration limits are a component of the Water Quality Protection Standard [Standard] which is used to determine if a release from a waste management unit occurs, to evaluate changes in water quality which result from a release, and to determine the success of corrective actions. In order to serve these functions, a concentration limit for each Constituent of Concern must be established as a basis of comparison with water from downgradient of the unit. In order to adequately protect water quality, each concentration limit must be based on criteria which are appropriate for the function of the Standard in the particular program [i.e., Detection Monitoring, Evaluation Monitoring, or Corrective Action Program]. In order to provide for appropriate data analysis, a concentration limit must be established for each of the media [ground water, surface water, or the unsaturated zone] within which sampling for the constituent will be conducted.

This section is based on 40 CFR 264.94 [also see 47 FR/5. Concentration Limits and a. Alternatives Examined]. This section is consistent with the EPA's approach for defining concentration limits except that the term "alternate concentration limits" [ACLs] used in 40 CFR Subpart F is not used in revised Article 5 to ensure that the differences between the State and Federal three-phase monitoring and response strategies, as discussed in the introduction, are clear.

Under 40 CFR Subpart F, the provision for establishing ACLs is consistent with the focus of the Compliance Monitoring Program which is to provide more extensive monitoring of the detected release and to determine whether "evidence of increased

contamination" occurs when one of the concentration limits is exceeded at one of the monitoring points specified in the Water Quality Protection Standard. The ACL is allowable if the owner or operator can show that, as long as the concentration of a hazardous constituent does not exceed the ACL at the compliance point, the concentration of the constituent at downgradient points of water use will be within commonly accepted health standards. Thus, under Subpart F, the concept of "ACLs" is associated with allowing a level of degradation to take place before remedial action is considered; therefore, a known release can continue so long as the water quality at the downgradient "point of exposure" does not get too high. This approach is not included in the monitoring and response strategy of revised Article 5, in order to prevent degradation of waters of the State whenever possible. Therefore, this section does not include a provision for establishing "ACLs".

**Comments on Section 2550.4:**

**Comment:** "Practical quantitation limits" [PQLs] or background levels [if higher than the PQL] should be used for setting the Water Quality Protection Standards or Concentration Limits, because laboratory results below the PQL do not provide an accurate indication of the amount of a constituent that is in a sample, and thus statistical comparisons will be incorrect. In addition, the term "Water Quality Protection Standards" duplicates the term "Concentration Limits"; thus, to avoid confusion, only the latter term should be used. [48D]

**Response:** The regulations were not changed in response to this comment for the following reasons. This section provides that only the background value shall be used for a Concentration Limit during both the Detection Monitoring and the Evaluation Monitoring Programs because non-parametric statistical methods provide reliable results in cases where most or all of the data is in a non-numeric format [i.e., either "trace", or "not detected"]. In light of this, it would be inappropriate to use the PQL as a Concentration Limit because such an approach would allow releases from the Waste Management Unit so long as the release does not increase above the PQL, even though such releases are demonstrably detrimental to water quality. The portion of this Statement of Reasons addressing Subsections 2550.7(e)(8)(B) and (e)(9)(E) provide further discussion on this topic. The Concentration Limits are a component part of the Water Quality Protection Standard, as used in the revised article. This topic is discussed in detail in the

introduction to this Statement of Reasons and in that portion of the Statement of Reasons addressing revised Sections 2550.2 and 2550.4.

**Comment:** Subsections (b) and (c) of this section exceed the authority of the State Board by giving the regional boards authority for determining the levels of individual chemical constituents that will pose a risk to human health and the environment. It is the duty of the Department of Health Services to establish what levels of chemicals constitute a risk to public health; whereas that of the regional boards is to preserve beneficial uses of water, pursuant to Section 13001 of the Water Code. [42E]

**Response:** The regulations were not changed in response to this comment because W.C. 13304 gives the regional boards very broad authority to require dischargers to cleanup and abate the effects of discharges that cause or threaten to cause conditions of pollution or nuisance, as those terms are defined in W.C. 13050. In order to exercise this authority regional boards must assess the potential impact of a discharge on beneficial uses of waters of the State, including risks to "human health and the environment". In so doing regional boards would of course rely on technical input from the Department of Health Services [Department], Toxic Substances Control Division, regarding the levels of exposure to particular chemicals, or combinations of chemicals, that could affect public health. However, the Department's acknowledged expertise in this area does not preclude regional boards from exercising their independent authority to set cleanup levels which, in the opinion of the regional board, are protective of beneficial uses of waters of the State.

**Comment:** This section should be rewritten to permit contiguous units to share a single monitoring program, as allowed under Subsections 2550.5(b) and 2550.7(e)(3) of the revised article, rather than particularizing the concentration limits to each waste management unit as it presently does. [29A]

**Response:** The regulations were not changed in response to this comment because nowhere in the revised article is there wording permitting several units to share a monitoring and response program, as implied by the comment. Revised Subsection 2550.5(b) permits units to share a point of compliance under certain

circumstances, but each such unit must have its own monitoring and response program [see revised Subsection 2550.1(a)]. Revised Subsection 2550.7(e)(3) permits units to share a monitoring system under certain conditions, but that is only to obviate the need to install redundant systems for each unit in cases where a single system could be as effective. However, each unit sharing such a system would have its own monitoring and response program, including its own Water Quality Protection Standard, and the frequency of monitoring, the list of Constituents of Concern, and the list of Monitoring Parameters could be substantially different among the various units sharing such a system. This approach is used in order to maximize the ability for contiguous units to share monitoring equipment while at the same time accommodating the possibility that each such unit could contain a different type of waste.

**Comment:** For clarity, Subsections (c)(1), (c)(2), (c)(3), and (c)(4) of this section should use the term "concentration limit greater than background" instead of "concentration limit." Without this correction, the subsections could require the concentration limit for the water quality protection standard to be set below the background value. This does not seem to be the intent of the regulations. [27A55b]

**Response:** In response to this comment, the phrase "concentration limit" has been replaced with the phrase "concentration limit greater than background" as appropriate throughout the revised article. In addition, for the sake of clarity, this section has been rewritten and reorganized. The subsections referenced in the comment are not Subsections (c), (e)(1), (e)(2), and (d) of this section, respectively.

**Comment:** For consistency with 40 CFR Subpart F, mention of underground sources of drinking water as identified by the Federal UIC Program [see 40 CFR 264.94(c)] should not be deleted from the regulations. It is difficult to determine whether the UIC Program would be consistent with the criteria listed in revised Subsection 2550.4(c)(4)(B) [as renumbered in revised draft] in identifying underground sources of drinking water, or whether the UIC Program would designate certain aquifers underground sources of drinking water which the regional board would not view as such. If any aquifer is designated an underground source of drinking water by the UIC Program, the regional board should consider this designation in establishing concentration limits greater than background, whether or not the

regional board agrees with the designation. [Note that 40 CFR 264.94(c) refers to Section 144.8 in error. The correct reference is 144.7]. [27A56c]

**Response:** The regulations were not changed in response to this comment because the referenced Subsection is already sufficiently clear concerning consideration of all present and potential uses of ground water in area. In addition, new Subsection (e)(3) provides a "cap" to any concentration limit greater than background [CLGB] by stating that no CLGB may be allowed which exceeds the water quality objective for that constituent in the applicable Water Quality Control Plan [Plan] and also provides for similar consideration in cases where the Plan does not anticipate addressing a constituent. One of the beneficial uses addressed by the applicable Plan is the potential for each ground water body in its purview to be used as a source of drinking water.

**Comment:** Subsections 2550.4(c)(6), (c)(7), and (c)(8) of the April 25, 1989 draft should be listed separately rather than being connected by semi-colons. [37K]

**Response:** In response to this comment, the referenced Subsections have been renumbered separately from each other. They are now Subsections 2550.4(g), (h), and (i), respectively.

#### Subsection 2550.4(a)

##### Specific Purpose

The specific purpose of this subsection and the subsections under it is to set forth criteria that must be used for establishing concentration limits for the Constituents of Concern.

##### Factual Basis

The discharger is required to submit the initial concentration limit proposals because the discharger is responsible for conducting water quality analyses for purposes of establishing the Water Quality Protection Standard [see Article 9, Subsection 2595(g)(6) of Chapter 15] and, as described above, the concentration limits are a strategic part of this Standard.

**Comments on Subsection 2550.4(a):**

**Comment:** The requirement under Subsection 2550.4(a)(1) that a concentration limit not to exceed a constituent's background value is too stringent because the Porter-Cologne Water Quality Control Act and several State Board findings in this area indicate that a concentration limit should only be low enough to protect beneficial uses of waters of the State. [12J,16F]

**Response:** The regulations were not changed in response to this comment for the following reasons. The Porter-Cologne Water Quality Control Act [Porter-Cologne] does not provide dischargers with a sanction to contaminate ground water to a certain degree. Releases from lined waste management units are not permitted under Chapter 15, which was promulgated pursuant to and under the authority of Porter-Cologne. Revised Article 5 carries on the spirit of the article it replaces in Chapter 15 by requiring each release to be investigated and remediated. In addition, Subsection 2550.4(a)(3) provides for the granting of concentration limits greater than background for use as cleanup standards during corrective action. The "reasonable protection of beneficial uses" is attained through cleanup to concentrations that are protective of those uses. The use of such elevated concentration limits during detection monitoring prior to a release would not be appropriate because such a practice would act as a license to contaminate the ground water up to a certain concentration, but no further. The granting of concentration limits greater than background is not done for the convenience of the discharger. Rather, such elevated cleanup concentrations are made necessary by the fact that it is often not possible to cleanup to the background concentration under existing cleanup technology.

**Comment:** Concentration limits which cannot exceed background are too stringent in cases where only non-hazardous constituents are produced, such as with woodwaste sites on the North Coast. [23J]

**Response:** The regulations were not changed in response to this comment for the following reasons. If the regional board has found that such units have potential to degrade beneficial uses of waters of the State, then these units are classified waste management units under Chapter 15 and the regional board will have issued Waste Discharge Requirements implementing the provisions of that chapter, including the monitoring and response programs under repealed Article 5. Under such conditions revised



Article 5 will be applied, once it replaces repealed Article 5. Concentration limits greater than background were not provided for under repealed Article 5, whereas revised Article 5 provides for the use of such elevated limits as cleanup concentrations for corrective action. The use of such elevated concentration limits during detection monitoring prior to a release would not be appropriate because such a practice would act as a license to contaminate the ground water up to a certain concentration, but no further.

**Comment:** The wording of Subsection (a) does not reflect that the same Constituent of Concern can have different concentration limits at various monitoring points throughout a given medium on the basis of either the establishment of background values [e.g., some older wells using intra-well comparison under Subsection (a)(2); whereas newer wells referencing to upgradient background monitoring points under Subsection (a)(1)] or the establishment of a concentration limit greater than background under Subsection (a)(3). [18M,25M]

**Response:** In response to this comment, Subsection (b) has been reworded to list the various conditions under which it is appropriate to have different concentration limits for the various monitoring points in a given medium.

**Comment:** The discharger (or the regional board) should not be allowed the option to decide whether or not ground water could be affected by a release from the waste management unit. In 40 CFR 264 Subpart F, once the list of hazardous constituents is set pursuant to Section 264.93, a concentration limit must be set for each constituent: no further "out" is allowed. Further, it is important to note the logical error between the wording in Section 2550.3, and that in Subsection 2550.4(a). Section 2550.3 states that the Constituents of Concern shall include the following: waste constituents, reaction products, and hazardous constituents that are reasonably expected to be in or derived from waste contained in the waste management unit. According to this requirement, the Constituents of Concern will be the same for all three media, since the individual nature of each monitored medium is not a criterion for setting the Constituents of Concern. However, Subsection 2550.4(a) implies that, once the Constituents of Concern are identified, the discharger need not propose concentration limits for them in all media. Therefore, the nature of the media becomes a criterion for whether or not to set concentration limits for the Constituents of Concern. This

is not consistent with Section 2550.3: in effect the list of Constituents of Concern could be different for different media. [27A128]

**Response:** This comment identifies an inconsistency in the revised regulations. This subsection has been rewritten to require the discharger to propose, for regional board approval, concentration limits for each medium "monitored pursuant to Section 2550.7 of this article". The phrase "that could be affected by a release from the waste management unit" has been removed from this subsection. Since Section 2550.7 always requires that ground water be monitored, this will not be less stringent than the federal requirement.

**Subsection 2550.4(a)(1)**

Concentration limits under this subsection are intended to reflect background water quality conditions [i.e., the quality of water that is unaffected by a release from the waste management unit] in order to ensure that the quality of the waters of the State are not degraded by discharges of waste to land. This background data is used as a frame of reference against which the quality of water samples collected from downgradient of the unit can be compared. This approach is consistent with authority provided under Porter-Cologne to protect water quality from degradation whenever possible and to protect all existing and potential future beneficial uses of waters of the State. As discussed in the introduction to this Statement of Reasons, this approach maintains the monitoring strategy imposed under repealed Article 5 of Chapter 15 [see Subsection 2552(b)]. Also, this section provides for the use of a numerical concentration limit because, in cases where background concentrations of a constituent do not display appreciable variation, a concentration limit can be established which is based on data that are readily available prior to waste discharge.

**Subsection 2550.4(a)(2)**

The option of establishing concentration limits which are based on narrative standards is provided under this subsection in order to ensure the use of limits which are most representative of actual background water quality at the waste management unit. The State Board recognizes that waste management units may be regulated over long periods and that background concentrations may change for reasons unrelated to waste management. Under such conditions, the performance of the statistical analysis is enhanced if the concentration limit is adjusted to reflect

seasonal fluctuations or other factors of natural variation [factors unrelated to waste discharges at the unit] in water quality. This is accomplished by continually updating the background water quality data for a constituent and establishing a limit based on the updated data.

This requirement is consistent with modifications made to the 40 CFR Subpart F regulations as set forth in the 40 CFR Part 264, Statistical Methods for Evaluating Ground-Water Monitoring From Hazardous Waste Facilities; Final Rule [also see the specific discussions B.4. Data Variability and Sampling Procedures, and B.6. Determining Background Concentrations (53 FR)].

**Comment on Subsection 2550.4(a)(2):**

**Comment:** The regulations in this subsection appear to be less stringent than the corresponding regulations under 40 CFR Subpart F. Specifically, this subsection allows the concentration limit to be equal to an adjustable background value, which would reflect the current background levels in the ground water, as long as the procedure for establishing and updating the background value is specified in the Waste Discharge Requirements. This approach appears more accurate than the approach taken in Subpart F; however, it is possible that using background values that fluctuate "automatically" would increase the likelihood that the regional board will not be alerted to unusual occurrences in the ground water. This difficulty might be addressed by requiring that the discharger re-evaluate annually the procedure which is specified in the Waste Discharge Requirements [pursuant to this subsection] for establishing and updating concentration limits equal to background. The re-evaluation would be submitted to the regional board for review. [27A129]

**Response:** The regulations have not been changed in response to this comment for the following reasons.

During a detection monitoring program under Subpart F, the background value of a Monitoring Parameter may be continually recalculated to reflect natural variation in ground water quality. [See the Federal Register for October 11, 1988 - 53 FR 39723.] When the ground water protection standard is established under the federal regulations for either a compliance monitoring or a corrective action program, concentration limits are specified for each hazardous constituent. When asked why the regulations do not address natural variation in ground water quality during

these programs, USEPA technical staff in Washington, D.C. explained that they were concerned that there would be trouble enforcing a "standard" that had variables in it. The State Board's regulation writing team believes that the revised regulations have successfully solved that problem by requiring that the Waste Discharge Requirements contain a detailed description of the statistical procedures to be used to update background values, and by requiring the water quality protection standard to contain a statement that, at any point in time, the concentration limit for a constituent will be equal to the background value of that constituent, as determined through use of the specified procedure.

Under the federal regulations, the water quality protection standard is established during the compliance monitoring program. Corrective action is required only after the standard has been exceeded. Under the revised regulations, the water quality protection standard is not used during evaluation monitoring to trigger corrective action. [The Standard is established at background values during detection monitoring. Once the Standard is exceeded, the discharger initiates an evaluation monitoring program to determine the nature and extent of the contamination and to prepare for corrective action.] Therefore, the only potential problem caused by allowing concentration limits to vary is in the establishment of "clean-up concentrations" for a corrective action program, to the degree that these might differ from their respective background values.

In the case where the background quality of ground water is improving, the revised regulations are more stringent than the federal regulations because the discharger would be required to achieve the new, lower concentration limits. In the case where the background quality of ground water is deteriorating, staff believes that the legal responsibility of the discharger to perform corrective action must be limited to the removal of any contamination contributed to the aquifer due to the release from the waste management unit, rather than forcing the discharger to clean up ground water constituents that are arriving from upgradient of the unit.

The State Board's regulation writers believe that, in practice, the federal regulations would operate to allow the same "clean-up concentrations" that would be allowed under the revised regulations. If a discharger determined that deteriorating background ground water quality was causing the discharger to continue corrective action beyond what would be required due to a release from their unit, the discharger would submit an

application to end corrective action. At that point the Regional Administrator could establish new concentration limits equal to the current background values for each constituent. Since a public hearing is required under the revised regulations for amending the Waste Discharge Requirements to end a corrective action program, it appears that the end result would be the same as it would be under the federal regulations. Further, the revised regulations are technically sound, more straight-forward than the existing federal requirements, and address in a logical manner the problems caused by variations in water quality that are not related to a release from the unit.

**Comment:** Remove the phrase "that the Waste Discharge Requirements include a statement" from the first part of this subsection. [37G]

**Response:** The regulations were not changed in response to this comment because this phrase is needed for clarifying the first historical use of a non-fixed concentration limit in a water quality protection standard. The USEPA permits a non-fixed background concentration for use in detection monitoring, but uses only a fixed value once the discharger enters the compliance period and the ground water protection standard is created. Therefore, the State Board's provision for use of a non-fixed background value in any of the monitoring and response programs is a new application. The USEPA has requested that, for clarity, this new provision should include language stating specifically that the method used to obtain the background value should be included into the Waste Discharge Requirements.

**Subsection 2550.4(a)(3)**

Although this section requires concentration limits to equal background water quality in most instances, State Board staff recognizes that once a release has occurred it can be extremely difficult, or impossible, to fully return polluted media to their background water quality state. Therefore, this subsection provides for establishing concentration limits which are greater than background water quality concentrations for certain constituents under certain circumstances, in order to ensure that corrective action efforts are focussed on the most effective approach to protecting human health and the environment.

**Subsection 2550.4(b)****Specific Purpose**

The specific purpose of this subsection is to ensure that all proposals regarding the establishment of concentration limits are reviewed by the regional board and that the approved [or modified] limits and any approved [or modified] procedures for establishing these limits are specified in the Waste Discharge Requirements.

**Factual Basis**

This requirement represents a non-substantial change from repealed Article 5, Section 2552 of Chapter 15 under which the regional board was responsible for establishing the water quality protection standards, with the exception that the revised regulations recognize specific conditions under which it may be appropriate for the regional board to assign different concentration limits to specific groups of monitoring points in the same medium. This adjustment was necessary because the increased complexity and specificity of the revised article with regards to the monitoring of more than one aquifer, the use of intra-well comparisons, and the use of concentration limits greater than background have made it essential to recognize the need for flexibility in the assignment of concentration limits.

**Subsection 2550.4(c)****Specific Purpose**

The specific purpose of this subsection is to set forth the criteria to be used by the regional board in considering whether or not to permit the use of concentration limits greater than background, for a corrective action program.

**Factual Basis**

In order to ensure that corrective action efforts are focussed on the most effective approach to protecting human health and the environment, this subsection sets forth specific criteria which constitute a reasonable prerequisite to the discharger's being able to obtain a cleanup concentration greater than background [CLGB]. The pivotal issues are that the discharger must prove that reattaining the background concentration is technologically infeasible or economically infeasible and that the CLGB proposed

as a cleanup concentration is fully protective of human health and the environment.

It is reasonable for the regional board to be able to grant a CLGB under certain circumstances. For example, if existing technology is unable to achieve the cleanup or if the cost of the cleanup far outweighs the economic cost to the people of California resulting from the release of that constituent then it is inadvisable to require cleanup to background. It should be noted that the regulation does not address economic inconvenience, but rather economic feasibility. Therefore, the degree of fiscal inconvenience experienced by the discharger in pursuing cleanup to background should not be a major consideration in the discharger's demonstration. Rather, the potential total cost to the discharger in achieving total cleanup should be compared to the potential total cost to the people and to the environment of not cleaning up to background.

As discussed previously, it is the intent of these revised regulations to maintain background water quality as the goal for corrective action. It is necessary to gather a sufficient amount of site-specific data and review that data to identify potential remedial action objectives and likely remedial action alternatives for a release from a waste management unit. Based on the complexity of the site and the magnitude of the release, the regional board may determine that there are no potential treatment technologies that will satisfy the background water quality objective for all the Constituents of Concern. Upon screening the potential technologies, based on their effectiveness, implementability, and cost, the regional board may determine that some degree of degradation is inevitable. In these cases, it is necessary to balance the possible cost of remedies against the benefits to be gained. However, the regional board is not allowed to grant a CLGB which will cause a threat.

**Comments on Subsection 2550.4(c):**

**Comment:** The word "substantial" should be eliminated from Subsection 2550.4(c) because any release from essentially any type of waste management unit - landfill - should be considered "substantial" in its ability to adversely affect domestic water supply water quality. [67H {pages 22-23}]

**Response:** The regulations were not changed in response to this comment for the following reasons.

Although a release from a waste management unit inherently poses a threat to water quality, and therefore to human health and the environment, a release cannot be prevented after the fact and often it is not possible to return the affected aquifer to its background concentrations. In such cases, this subsection permits the regional board to grant a concentration limit greater than background [CLGB] but only if the CLGB will not pose a "substantial" threat. It is not possible to reliably predict that there is absolutely no threat in such cases; therefore, the elimination of the word "substantial" would preclude any CLGB from being granted. This wording is necessary both for clarity and for enabling a CLGB to be allowed that is protective of the beneficial uses of the affected water body to the greatest extent feasible.

Until there is a reasonable, functional alternative to the discharge of waste, a certain risk must be borne concerning degradation of beneficial uses. Although that risk should be minimized to the greatest extent feasible, the subject cannot simply be swept under the carpet by either prohibiting discharge or by requiring an impossible level of cleanup. The proposed article utilizes a pragmatic approach affording both effective vigilance in detecting a release and workable remediation options in the event of a release.

**Comment:** Some commentators objected to any relaxation of cleanup levels [3,17] whereas others supported the greater pragmatism reflected in the revised regulations [26]. One commentator asserted that the minimum cleanup requirement should be the background concentration to protect the waters of the State from any degradation. [17D] Two commentators suggested that economic considerations should not have a part to play in determining the cleanup concentration. [17C,3C] One commentator interpreted this subsection to mean that the ability to grant concentration limits greater than background will enable the regional board to weigh the economics of a cleanup action versus maintaining the beneficial uses of the waters of the State and protecting human health and the environment. [26D]

**Response:** In response to these comments, the wording concerning consideration of technical and economic limitations in establishing cleanup concentrations has been changed. Under Subsection (c), the discharger must first prove that it is not possible to cleanup to background, before a higher concentration limit can be considered. Secondly, Subsection 2550.4(e)(2)



provides that a concentration limit greater than background cannot exceed the lowest concentration that technological and economical considerations make possible. Other considerations in Subsection 2550.4(c) are then considered in determining how much below this maximum concentration the cleanup standard should be lowered to protect all beneficial uses. Note that this wording also makes cleaning up to background mandatory when it is feasible to do so. Although the goal of these regulations is to prevent and/or remediate any degradation of the waters of the State, it is important to recognize that it may not always be possible to cleanup to the background concentration. In those instances where it is technologically or economically infeasible to attain background levels, the regional board may establish a concentration limit greater than background only if all of the requirements of Section 2550.5 have been met.

**Comment:** Two commentors argued that a discharger that cannot afford to cleanup a release should not be permitted to continue operating. [3C,17C] "Technological feasibility" and "economic feasibility" of cleanup should be considered as siting issues rather than after a release has occurred. If a discharger cannot demonstrate, prior to issuance of a permit, the ability to cleanup to background levels, then a permit should not be issued. [52A]

**Response:** The regulations were not changed in response to this comment because Subsection 2550.0(a) already requires the discharger to provide financial assurance that corrective action can be completed in the event of a release and because cleanup to background may not be technologically possible in many instances. In addition, this rulemaking does not address the siting criteria, which are contained in Article 3 of this chapter.

**Comment:** One commentor stated that the revised regulations did not include the Maximum Concentration Limits [MCLs] used in the federal regulations [Table 1 from 40 CFR 264.94], and that cleanup to background levels is not always required to protect human health and safety. [28G]

**Response:** The regulations were not changed in response to this comment for the following reasons. This section already includes reference to the federal MCLs [Subsection (e)(1)]. In addition, the protection of human health and safety is not the only consideration that must be made when establishing concentration limits for corrective action. The revised regulations are

consistent with Chapter 15 requirements and State Board policy to prevent degradation of the waters of the State [State Board Resolution No. 68-16]. Under the revised regulations, the discharger may propose concentration limits greater than background if all of the requirements of Section 2550.4 have been satisfied including, but not limited to, consideration of sensitive biological receptors [e.g., human, mammal, plants, etc.] that could be affected by the revised concentration limits.

**Comment:** Subsection (c), as it appears in the original notice package for revised Article 5, should be reworded. As written, requirements for setting concentration limits greater than background for the water quality protection standard appear to be less stringent than those in 40 CFR 264.94(b). However, upon close literal reading, they prove to be more stringent. Because of the organization and wording of Subsection (c) of this section, the intention of the regulations is left subject to misinterpretation, and this misinterpretation would result in the implementation of less stringent requirements. For example, under revised Article 5, a waste management unit is not eligible for concentration limits greater than background for their clean-up standards if it is technologically or economically feasible for the facility to reach background levels in a corrective action clean-up. However, Subsection (c)(1) does not clearly state this; instead the language would be readily misinterpreted to allow a discharger to obtain a concentration limit greater than background on the basis of the technological or economic infeasibility of reaching background in a corrective action clean-up. In Subpart F, technological or economic infeasibility are not criteria which an alternate concentration limit may be based on. In general, it is not clear in Subsection (c) that it is the lowest concentration limit greater than background, obtained by applying the criteria in each of its Subsections, which must be used. It is hereby recommended that Subsection (c) be reorganized so that it is clear that the lowest concentration limit greater than background which is obtained by applying the criteria in each of its Subsections is the concentration limit greater than background which must be used. [27A130]

**Response:** In response to this comment, Subsection (c) has been completely reorganized and rewritten with the assistance of USEPA technical staff. The requirements addressed in this comment are now found in Subsections (c) through (h) of this section. The USEPA has reviewed and approved the modified language. It is appropriate to apply these requirements to all classes of waste management unit, because all units can have a need for obtaining

clean-up concentrations greater than background. The revised regulations provide a rational means for establishing concentration limits greater than background as requested by a discharger, regardless of the classification of the unit.

[Eliminated Subsection 2550.4(c)(4)(A)]

Comments on [Eliminated] Subsection 2550.4(c)(4)(A):

**Comment:** This consideration should be removed from the list of criteria used to establish concentration limits greater than background because it does not name the specific federal, state and local agencies, and the specific programs within those agencies are not identified. Therefore, it is not possible to determine whether the criteria these agencies use to set these standards are equivalent to the criteria in 40 CFR 264 Subpart F [listed in Subsection 264.94(b)]. It is possible that the criteria used by these agencies in a "health or environmentally based standard" could be higher than the alternate concentration limit which would be set under Subpart F. In this way the revised regulations could allow this higher health or environmentally based standard to affect the decision-making process for setting concentration limits greater than background which are higher than the corresponding alternate concentration limit that would be granted pursuant to Subpart F. [27A132]

**Response:** In response to this comment, this subsection has been deleted.

Subsection 2550.4(d)

Because discretion must be used when establishing each concentration limit which is greater than background [CLGB], a combination of ambient [site-specific], numeric, and narrative criteria are set forth under this subsection for determining concentration limits that will be protective of human health and the environment. Given a potential for a CLGB to range between the background concentration and an upper limit [under Subsection (e) of this section, resulting from limitations imposed by other applicable health-based standards], these criteria are used to determine the proper concentration within this range to assign as the concentration limit. Subsection (f) of this section requires that all these criteria to be used such that any exposure to the affected water is assumed to occur at the point of compliance, with the result that attenuation cannot be used to justify a high-concentration CLGB. The considerations

under Subsection (d) of this section can therefore only be used to determine how far below the upper limit the CLGB should be. Therefore, each consideration under this subsection either lowers the CLGB's concentration or fails to lower it, and no consideration can be used to raise it.

**Comments on Subsection 2550.4(d):**

**Comment:** For consistency with 40 CFR 264.94(b)(1)(i), the mention of "potential for migration" should not have been absent from the list of items which the regional board must consider in establishing a concentration limit greater than background. The Statement of Reasons for this subsection suggests that the item was deleted to preclude the consideration of attenuation in establishing concentration limits. However, it is desirable that considerations of high mobility affect the decision-making process as well. [27A55c]

**Response:** The regulations have not been changed in response to this comment for the following reasons. To our knowledge, there are no reported cases where a constituent has migrated faster than the ground water in which it is contained; therefore, the USEPA language could only be used to justify consideration of attenuation, thereby enabling the use of a higher CLGB than would otherwise be considered. State Board staff has not found support for the idea that retardation by attenuative mechanisms can be accurately predicted and can, therefore, not consider allowing such mechanisms to be relied upon in setting concentration limits greater than background.

**Comment:** For clarity, Subsections (c)(7) and (c)(8) [ED: of the originally noticed version of this article] should be removed from Subsection (c) and renumbered as Subsections (d) and (e). This change would enhance clarity because these two Subsections are not requirements which must be satisfied when setting a concentration limit greater than background, but rather are restrictions which govern when and how such concentration limits can be applied after they are established. [27A56a]

**Response:** In response to this comment, this entire section has been reorganized to enhance clarity. Referenced Subsections (c)(7) and (c)(8) have been reworded for clarity and renumbered as Subsections (h) and (i) of this section, respectively.

**Comment:** Reference to Water Quality Control Plans should be removed from the list of criteria used to establish concentration limits greater than background. Water Quality Control Plans are regional board or State Board plans for providing guidelines for management of water resources in various regions across the state. The recommendations in Water Quality Control Plans are based on economic, political, demographic, and land use considerations. These criteria are potentially less stringent than those in 40 CFR 264 Subpart F: economic and political criteria, for example, are not considered in 40 CFR 264.94(b). Thus, water quality objectives, which are concentration limits established in the Water Quality Control Plans, may be set higher than the alternate concentration limits which would be set under Subpart F. Revised Article 5 would allow this higher water quality objective to affect the decision-making process for setting concentration limits greater than background, which could result in a concentration limits greater than background which is higher than the corresponding alternate concentration limit under Subpart F. References to water quality objectives and Water Quality Control Plans should be removed from Subsections (d)(1)(E) and (d)(2)(F).

[27A133]

**Response:** In response to this comment, the requirement that the regional board consider water quality objectives established in Water Quality Control Plans when establishing concentration limits greater than background has been moved and rewritten. Subsection 2550.4(e) now states that the provisions of this article do not allow the regional board to award CLGBs which exceed the maximum concentration that would be allowed under other applicable statutes or regulations. This requirement helps to assure consistent use of regulatory authority by both the regional boards and the Department of Health Services [in that agency's paralel regulations] in a manner which is most protective of the environment.

**Subsections 2550.4(d)(1)(A-I) and (d)(2)(A-J)**

These criteria are based on the criteria set forth under 40 CFR 264.94(b) regarding the establishment of appropriate alternate concentration limits for a Compliance Monitoring Program. However, under the revised regulations, these criteria must be considered as part of the determination for appropriate concentration limits for a Corrective Action Program rather than for a Compliance Monitoring Program. Also, it is required under

revised Subsection 2550.4(f) that these criteria be applied such that the risk associated with establishing a concentration limit for a constituent is determined for a particular monitoring location by an evaluation which is analogous to setting the point of exposure at each monitoring point [including the wells at the point of compliance]. Thus, it is not the intention that the criteria specified under this revised Subsection be used to consider the potential for migration of the waste for purposes of justifying greater concentration limits based on attenuation or dilution factors, as provided for under Subpart F.

The regional board is required to consider the water quality objectives for ground water and surface water set forth in applicable Water Quality Control Plans [Basin Plans]. Basin Plans contain identification of beneficial uses of waters in each region of the State and provide evidence for establishing water quality objectives for those waters based on these uses; therefore, these objectives must be considered for corrective actions associated with these waters as part of the State Board's and the regional boards' responsibility to protect beneficial uses of waters of the State. These requirements are also consistent with the Subpart F requirement under 40 CFR 264.94(d) to consider the use of ground water in the area around the facility and any identification of underground sources of drinking water, when establishing alternate concentration limits for a compliance monitoring program. Consideration of the Basin Plan automatically takes these considerations into account.

The criteria specified under 40 CFR 264.94(b)(2) regarding effects on surface water quality are limited to surface water which is "hydraulically connected" to the uppermost aquifer underlying the waste management unit. The regulations of revised Article 5 are set forth to provide protection to waters of the State. Waters of the State are not limited to surface waters "hydraulically connected" to the uppermost aquifer under the waste management unit; therefore, the criteria set forth under this revised Subsection are not limited in this way.

Subsection 2550.4(e)Specific Purpose

The specific purpose of this subsection is to provide necessary upper limits to the concentration limits greater than background granted a discharger pursuing corrective action and to clarify that other applicable laws and/or regulations limiting concentrations of constituents in water are not circumvented in granting a concentration limit greater than background.

Factual Basis

In spite of the considerations made pursuant to Subsection (d) of this section in establishing a concentration limit greater than background [CLGB] for use in corrective action as a cleanup concentration, there are a few instances in which it would be possible, using these considerations alone, to award a CLGB that is either higher than would be allowed by another resource agency under similar circumstances or is not as protective of human health and the environment as it is feasible to be under the circumstances. The provisions of this subsection serve as upper limits to the CLGB under these conditions.

Subsection (e) refers to the federal Maximum Contaminant Levels [MCLs] and any other applicable standards promulgated by the USEPA or by DHS because such promulgated health based standards should not be ignored in establishing cleanup concentrations. This criterion parallels the criterion set forth by the EPA under 40 CFR 264.94(a)(2) for providing a variance from concentration limits equal to background ground water quality concentrations in regards to constituents listed in Table 1 of that section.

Subsection (e) also refers to regional board Water Quality Control Plans [Basin Plan] because such plans have water quality objectives consisting of limits for various constituents which may impact beneficial. This requirement is necessary to ensure that concentration limits which are greater than background concentrations are consistent with the Basin Plan. This is consistent with protecting water quality under Porter-Cologne [WC 13001].

Subsection (e) precludes granting a CLGB higher than what is practical to achieve because the discharger whose unit has impacted beneficial uses should be required to restore those uses to the greatest extent that is feasible. When it is not technically or economically feasible to achieve the background

concentration for a constituent, it is necessary to establish a concentration limit which provides the highest degree of protection to water quality that can be reasonably supported. This requirement is consistent with regulating the quality of the waters of the State to attain the highest water quality which is reasonable [WC Section 13000 of Porter-Cologne].

**Comments on Subsection 2550.4(e):**

**Comment:** The proposed regulation states that concentration limits greater than background cannot exceed "applicable statutes or regulations". It is unclear as to which statutes would be applicable in different situations. The regulation gives an example of using MCLs; however these standards are applicable to drinking water and not necessarily to groundwater which is not of drinking water quality. The regulation should be more specific as to which statutes are applicable for the purposes of setting concentration limits. [66A]

**Response:** The regulations were not changed in response to this comment for the following reason. The commentor is in error regarding the wording of this subsection in that the wording does not incorporate other statutes and regulations by reference; rather, the wording states that the provisions of this article do not permit one to ignore other applicable statutes and regulations. Therefore, no condition-specific listing of statutes and regulations is necessary in this subsection.

**Comment:** The regulations should recognize that there is little need for stringent cleanup standards in instances where the affected waters have little or no beneficial use. [2E,26D,36R] The beneficial use designation itself should apply only to groundwater that is of sufficient quality and quantity to be used as a drinking water source, and only such water should be considered for cleanup to background concentrations. [26D,28H] Most water has some beneficial uses and all such uses should be considered, so that additional degradation of water quality should not be allowed. [7B,7C] A company should only be forced to clean up water that has beneficial uses. [8A]

**Response:** No change in the language is necessary in order to respond to this comment because Article 5, as revised, provides the regional board with broad discretion to set a concentration



limit [greater than background] appropriate for the protection of human health, the environment, and all beneficial uses of the waters. Note that this discretion also allows the regional board to assess the fact that affected waters may be of low quality to begin with, and may be unsuitable for most beneficial uses under "natural" [background] conditions. There are many beneficial uses that ground water can serve other than that of being a source of drinking water, therefore, the exclusion of all beneficial uses except its suitability as a source of drinking water is not in harmony with the Porter-Cologne Water Quality Control Act which charges the State Board with promulgating regulations that provide protection to all beneficial uses of waters of the State, including current uses, and foreseeable or potential future uses.

**Comment:** Subsection (e) establishes unrealistic upper limits to cleanup standards for ground waters that have no existing or potential beneficial uses, although this approach is appropriate where a drinking water source is impacted. [36L,57C] The commentor disagrees with our response to their comment in the SOR and suggests that the wording in this subsection be changed to read: "Except where the regional board determines that the medium affected by a release has no known or potential beneficial uses, a concentration limit greater than background..... shall not exceed any of the following:". [57C]

**Response:** The regulations were not changed in response to this comment because repealed Article 5 had no provision whatsoever for permitting cleanup levels other than background, even in waters which have little beneficial use. The approach used in revised Article 5 to establish elevated cleanup concentrations therefore represents a practical realization of the limitations of cleanup technology. This approach was carefully crafted so that the discharger could be given an increased degree of latitude with respect to monitoring and cleanup, but without diminishing the in-the-field effectiveness represented by repealed Article 5 with respect to the protection of human health and the environment. Providing still further latitude is not appropriate at this time, but may be considered in future revisions of the revised article if its field application proves it to be sufficiently robust to withstand further accommodation without diminishing protection of human health and the environment.

**Comment:** Subsection (e)(2) limits the granting of concentration limits greater than background for use in corrective action by requiring that the proposed concentration limit must be the lowest concentration that is technologically or economically "available". How is the discharger to determine which method is economically available? Criteria should be available to guide the discharger in such cases. [31E]

**Response:** The regulation was not changed in response to this comment because the word "available", upon which the comment hinges, is not to be found in this subsection, rendering the comment nonsensical. It is likely that the commentor misread the word "achievable", which is used in this subsection in a manner which makes sense.

**Comment:** Subsection (e)(3) does not incorporate the State Board's policy defining sources of drinking water. [18N,25N]

**Response:** The regulation was not changed in response to this comment because the language of this subsection references water quality objectives set for each constituent in the applicable Water Quality Control Plan, which plan must reflect the State Board's policy defining sources of drinking water. There is therefore no need to directly reference this State Board policy.

**Comment:** Subsection (e)(3) should be reworded so that it is clear that the lower of the following two is chosen for the concentration limit greater than background: a) the concentration limit established pursuant to the health based and environmental criteria in Subsection (d); or b) any concentration below that established pursuant to the criteria in Subsection (d), but equal to or above the background which is technologically or economically achievable. As written, Subsection (e)(3) could allow a concentration limit of, e.g., 15 to be used if that was the lowest concentration that is technologically or economically achievable, even if Subsection (d) would independently establish a concentration limit of, e.g., 5. Subpart F would not allow technological or economic considerations to raise the concentration limit above that established according to health based and environmental criteria. The subsection should be changed to read: "...the proposed concentration limit greater than background is no greater than the lowest concentration...." [27A131]

**Response:** In response to this comment, the subsection has been reworded as follows:

"(e) In no event shall a concentration limit greater than background established under this section for a Constituent of Concern exceed the lowest concentration that the discharger demonstrates and the regional board finds is technologically and economically achievable. No provision...."

#### Subsection 2550.4(f)

##### Specific Purpose

The specific purpose of this subsection is to establish that the location of exposure to biological receptors for each of the criteria specified under revised Subsection 2550.4(d) be applied such that the risk associated with establishing the concentration limit for a constituent is determined for a particular monitoring location by an evaluation which is analogous to setting the point of exposure at the point of compliance.

##### Factual Basis

This requirement is imposed to clarify that attenuation or dilution factors shall not be used to justify concentration limits greater than background because there are no known reliable methods by which attenuation can be predicted to the accuracy and precision that would be necessary to protect human health and the environment. This is not to imply that people are going to use the point of compliance wells to extract drinking water or that affectable fish populations are to be found in the bore-holes of these wells. Rather, this approach is a means to avoid permitting the degradation of beneficial uses in any larger area around the unit than is necessary. This approach, in combination with the requirement to design the monitoring system to achieve the earliest possible warning of a release, limits the geographical extent of the negative impacts from a release.

##### Comments on Subsection 2550.4(f):

**Comment:** Assessing the risk for biological receptors as if they were to be exposed at the point of compliance is overly conservative because few if any of the biological receptors potentially affectable by a release reside so close to the waste

management unit. [180,250] The evaluation of risk at the point of compliance (or the edge of the waste boundary) often could be unrealistic in the case where the discharger owns additional downgradient property. If the discharger secures the additional property physically and has provided for deed restrictions, then the threat of exposure is minimized. Risk is a factor of dose time exposure and if no exposure is possible, then no risk can occur. The discharger is still required to take corrective action and prevent off-site contamination. This requirements could create a burden to the regulated community for those sites where it physically may be impossible to clean up to zero. This new requirements should be stricken from the revised regulations. There should be provisions for non-use or distant use of the aquifer. [560]

**Response:** The regulation was not changed in response to these comments for the following reasons.

The granting of Waste Discharge Requirements does not provide the discharger with a right to pollute the waters of the State, even those waters that are under the unit or are under the facility; therefore, the size of facility owned by the discharger is not a factor of concern when considering how far a release can be allowed to migrate. In addition, although the revised article requires all affected waters to be addressed by the Corrective Action Program, there is no absolute requirement to clean up to background concentrations, as implied by the commentors; Concentration Limits greater than background can be granted under Section 2550.4.

Permitting the use of a presumed point of exposure distal to the unit implies that the discharger can make assumptions that attenuation will lower the concentration of the constituent considerably over the distance separating the unit from the actual point of biological exposure. This could permit the granting of extremely high concentration limits at the point of compliance. This is unwise because neither the rate of attenuation nor the actual path of contaminant transport can be accurately predicted. In addition, where attenuation does exist, its effect decreases according to a complex function over time as the attenuative capacity of the medium is reached. Worse yet, the attenuating medium, once it has reached its attenuative capacity, is itself a source of contamination as adsorbed constituents are released to the previously-uncontaminated water passing through it. Permitting the use of unsubstantiatable attenuation assumptions in setting concentration limits greater than background would allow high levels of leakage to exist and

would also permit the creation of an uncontrollable new source of contamination. Lastly, the use of a distal point of exposure would result in the elimination of beneficial uses in the area over which the attenuation is presumed to occur. This approach is rejected because it would not be protective of beneficial uses of waters of the State.

**Comment:** Subsection (f) does not reflect the State Board's policy defining the Point of Application [POA], which permits water quality objectives to be met at locations other than the point of discharge. [31F]

**Response:** The regulations were not changed in response to this comment because the State Board has not adopted a POA policy for ground water, as inferred by the commentor. In the absence of an adopted POA policy, the comment is invalid.

**Comment:** Subsection 2550.4(f) disregards beneficial uses by requiring the point of exposure to be set at the point of compliance without exception, thereby excluding consideration of attenuation in establishing cleanup concentrations greater than background. In addition to being a new regulation, with no basis in Chapter 15, Title 22, or RCRA, it appears to be inconsistent with many of the criteria which are specifically identified in Subsection 2550.4(d) as relevant to selection of concentration limits above background. [36S]

**Response:** The regulations were not changed in response to this comment because the requirements under this subsection are an essential key to a viable melding between the requirements of repealed Article 5 and those under the federal regulations of 40 CFR Part 264 Subpart F. In addition, with the exception of one minor portion of Article 4, which addresses unlined Class III landfills, Chapter 15 is written from the context that leakage from waste management units is not permissible and that once leakage occurs one must clean up to background throughout all portions of the affected aquifer. This approach does not tolerate consideration of attenuation. The corresponding federal regulations, under Section 264.94, permit the consideration of attenuation in certain instances when the discharger seeks concentration limits greater than background [called ACLs under the federal approach] after a release has occurred. In joining the State and federal regulations to create revised Article 5, the stringency of repealed Article 5 was partially relaxed in that cleanup levels can be set above the background concentration

in cases where cleanup to lower concentrations is not attainable. This arrangement is protective of water quality because the impact of the release upon water quality is remedied to the maximum practical degree. The use of attenuation, however, was not brought over from the federal regulations because its use would result in permitting cleanup concentrations that are much less stringent than can be obtained.

The federal approach countenances forfeiture of beneficial uses in the area between the source and the downgradient point of application because this area will have elevated contaminant levels. The State Board is charged under Porter-Cologne with protecting beneficial uses of waters of the State. There is no provision in the Water Code enabling the promulgation of regulations which will eliminate beneficial uses locally for the convenience of the discharger. Therefore, the consideration of attenuation when setting cleanup standards for classified waste management units is inappropriate.

**Comment:** This subsection seems to be out of place and is not clearly stated. [37H]

**Response:** In response to this comment, the subsection has been rewritten and renumbered as Subsection (f).

#### **Subsection 2550.4(g)**

##### **Specific Purpose**

The specific purpose of this subsection is to require the discharger to address the potential for the effects of the individual constituents in a release to be additive upon any potentially affectable organism.

##### **Factual Basis**

This requirement is included because the actual risk involved with exposure to a suite of chemicals is often far out of proportion to the maximum risk posed by any one of the constituents. The procedure described conforms to the standard toxicological procedures used by DHS when evaluating risk to human health and the environment. This procedure assumes that toxicological effects on the same organ are additive and that all

carcinogenic effects are additive, regardless of the principal organ affected prior to metastasis. As these regulations are minimum requirements, a far more stringent approach can be required by the regional board in cases where the effects of constituents are known to combine synergistically for any biological receptor.

**Comment on Subsection 2550.4(g):**

**Comment:** This subsection is applicable only to hazardous waste facilities. [42F]

**Response:** The regulations were not changed because the comment does not suggest a change. However, it is not clear how the commentor came to the conclusion that this subsection could apply only to Class I units, because there is no such limitation either contained in its wording or implied by it. Releases of waste can affect sensitive biological receptors [e.g., fish, humans, plants, etc.] regardless of what class of waste management unit is involved. The ongoing Solid Waste Assessment Test investigation of Class III landfills has shown that many of these relatively innocuous units release a variety of hazardous constituents on a regular basis. Therefore, it is appropriate to apply this subsection to all classes of waste management unit.

**Comment:** Subsection 2550.4(e) sets the maximum concentration limit [MCL] as the highest value for a Constituent of Concern, if applicable. Subsection 2550.4(g), however, limits the aggregate ratio of mixtures of Constituents of Concern to their respective promulgated standard to be less than one. These two Subsections are inconsistent. [18P, 25P]

**Response:** The regulations were not modified in response to this comment for the following reasons. Subsection 2550.4(e) does not set the concentration limit equal to the MCL, as implied by the commentor. Instead, it states that if a constituent has an applicable, promulgated health or water quality standard [of which the MCLs listed under 40 CFR Part 14 are a portion] then the concentration limit may not exceed that value. This does not preclude the granting of a concentration limit that is lower than the promulgated value. One condition under which a lower value would be appropriate is addressed under Subsection 2550.4(g), where several constituents have the capacity to act in concert to affect a given biological receptor in a similar way. In such cases the overall effect of the exposure must be limited such

that the biological receptor is not overwhelmed either by a given constituent or by several constituents acting jointly. These two subsections provide simultaneously applicable upper limits and, therefore, do not conflict with one another.

**Comment:** It is not clear how one would determine what an "excessive exposure" would be, as used in this subsection. Likewise, the term "a sensitive biological receptor" is not specific. Do you mean the most sensitive receptor, any sensitive receptor, or only one of the several sensitive receptors?[37I]

**Response:** In response to this comment, definitions for these two terms have been included in the revised revisions to Article 10 of this chapter.

**Comment:** It is not clear whether the health or environmentally based "standards" referred to in this subsection are promulgated standards.[37J]

**Response:** In response to this comment, this subsection has been rewritten to avoid reference to a specific list of promulgated standards. It should be noted, however, that the new wording precludes the use of CLGBs which are in excess of other applicable health-based standards.

#### Subsection 2550.4(h)

##### Specific Purpose

The specific purpose of this subsection is to ensure that degradation of water quality is not allowed at locations where water quality remains unaffected by any release from the waste management unit and to provide reasonable assurance that subsequent releases from the waste management unit are not left undetected.

##### Factual Basis

This requirement is consistent with regulating the quality of the waters of the State to attain the highest water quality which is reasonable [WC Section 13000 of Porter-Cologne]. Also, the discharger is required under revised Subsection 2550.1(c) of the



revised article to continue to conduct the elements of the detection monitoring program specified in the Waste Discharge Requirements that will be effective in determining if subsequent releases, other than the release being evaluated for corrective action, are occurring from the waste management unit. The objectives of the evaluation monitoring and corrective action programs are specifically directed at the detected release. For this reason, it is important that detection monitoring continue to be conducted to provide the data necessary to determine compliance with the Water Quality Protection Standard [Standard] established for the unit. In order to have an effective detection monitoring program at unaffected monitoring locations, the water quality protection standard established for the detection monitoring program must reflect background concentrations.

**Comments on Subsection 2550.4(h):**

**Comment:** This subsection should be reworded to make it clear in which program[s] the concentration limits greater than background may be used. [27A134]

**Response:** In response to this comment, Subsection (h) has been reworded to clearly permit concentration limits greater than background to be used only during corrective action, or at affected Monitoring Points following the successful completion of a corrective action program.

**Comment:** This subsection should begin "The concentration limit" rather than "a concentration limit"; the phrase "may only be applied" should be changed to "is only applied"; and the phrase "the release" should be changed to "a release". [37L]

**Response:** The regulations were not changed in response to this comment because the suggested language would imply that only a single concentration limit greater than background could be allowed and because each concentration limit greater than background is particular to a single release. However, this subsection has been rewritten to clarify the overall intent and to stipulate during which programs and under what specific limitations such concentration limits may be used. The word "may" is retained in the revised Subsection because the granting of a concentration limit greater than background is entirely discretionary on the part of the regional board.

**Subsection 2550.4(i)****Specific Purpose**

The specific purpose of this subsection is to require that concentration limits reflect current water quality conditions at the waste management unit.

**Factual Basis**

After the successful completion of a corrective action program takes place, site conditions can change such that water quality is naturally improved over time. Ground water recharge and other hydrogeologic conditions can create quantifiable improvements to water quality over time. Concentration limits must be established which reflect current water quality as necessary to ensure the effectiveness of achieving the objectives of the monitoring and response programs set forth under revised Article 5. This requirement is consistent with regulating the quality of the waters of the State to attain the highest water quality which is reasonable [WC Section 13000 of Porter-Cologne].

**Comments on Subsection 2550.4(i):**

**Comment:** The wording "current level of a Constituent of Concern" should replace "current water quality" in this subsection to avoid any confusion as to what is meant by "current water quality". [48E]

**Response:** The regulations were not changed in response to this comment because the current wording is sufficiently clear.

**Comment:** For clarity and/or consistency, this subsection should be changed as follows: the first sentence of this subsection should begin "When a discharger is conducting a detection monitoring program after a corrective action program has been terminated..."; the term "value" should be replaced with "concentration" in the second sentence; and "in the ground water, surface water, or unsaturated zone" should be added after "Constituents of Concern" in the second sentence. [27A56b]

Response: In response to the comment, the suggested changes have been made to this subsection.

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**Section 2550.5. Monitoring Points and the Point of Compliance.****Specific Purpose**

The specific purpose of this section is to assure that each waste management unit has enough monitoring locations that a release from the waste management unit will be discovered at the earliest possible time regardless of what portion of the unit the release escapes from.

**Factual Basis**

Waste management units are classified and regulated under Chapter 15 because the waste that they contain can irreparably pollute the waters of the State and in doing so endanger human health and the environment. The only way that waste management units can operate without posing, by their very existence, an unacceptable threat of degradation to waters of the State is that each unit must be provided with monitoring systems which are capable of providing an early warning of a release. In this way, the discharger and the regional board can respond expeditiously to a release. The earlier a release is discovered, the less the potential impact upon human health and the environment and the less cost the discharger will incur during Corrective Action. Because of variations in unit size, the type of waste accepted by the unit and the geology and hydrogeology underlying the unit, the specific monitoring requirements of each waste management unit are unique. Careful choice of the monitoring points will ensure the optimum number of monitoring points to satisfy the requirements of this section. On the other hand, if the monitoring points are chosen without due regard to the specific hydrogeologic conditions underlying and surrounding the unit, then the monitoring system will almost certainly fail to provide an early indication of the release regardless of how many monitoring points are installed.

This section is based on 40 CFR 264.95. This section conforms to the corresponding federal regulation except for the generic changes specified in the introduction to this Statement of Reasons and in the article overview and as described below.

**Comments on Section 2550.5:**

**Comment:** This section gives no criteria for minimum monitoring standards [e.g., number of monitoring wells] and seems to address the uppermost aquifer to the exclusion of other affectable aquifers. [42G]

**Response:** The regulations were not changed in response to this comment for the following reasons. Subsection (a) clearly requires the establishment of additional monitoring points pursuant to Section 2550.7, which in turn requires monitoring of all portions of the zone of saturation and of zones of perched water that could be affected by a release from the unit. Although the zone of saturation includes the uppermost aquifer, it also includes all additional aquifers, confining beds, and low-yield zones. Therefore, the article requires all ground water to be monitored which could be measurably affected by a release. The Point of Compliance is retained from the federal regulations under 40 CFR 264 Subpart F in order to clearly demonstrate compliance with those regulations, as required under Subsection 13172(d) of the Water Code. The number of monitoring points that are appropriate for monitoring a given medium at a particular waste management unit is a function of many factors; therefore stipulating a specific minimum number of monitoring points is inappropriate. Instead, the regulations under Subsections 2550.7(b), (c), and (d) provide performance standards for establishing an appropriate suite of monitoring points in the ground water, surface water, and unsaturated zone media, respectively.

**Comment:** The section should provide more latitude for placing the point of compliance at locations other than at the downgradient boundary of the unit. [120]

**Response:** The regulations were not changed as a result of this comment for the following reason. The placement of the point of compliance under revised Article 5 mirrors its placement under repealed Article 5 and under 40 CFR 264.95, namely that it must be located along the hydraulically downgradient boundary of the unit. No other placement would provide the earliest possible detection as a general rule.

**Comment:** The terms "waste management unit" and "point of compliance", as used in revised Section 2550.5, leave open

questions of interpretation that could be resolved with some clarification of the existing definitions. [12L]

**Response:** The regulations were not changed as a result of this comment for the following reasons. The commentor made no specific indication of the "questions of interpretation" supposedly involved with these two terms of art and State Board staff could find no inconsistency or unclear usage of these terms in the revised regulatory language.

**Comment:** Mandatory reference to the uppermost aquifer, as used in this section, is inappropriate at units where one of the following conditions apply:

1. The unit is underlain by homogeneous hard rock where related ground water may be structurally controlled and have limited extent if it exists at all; or
2. the depth to ground water is extreme and beyond the economically reasonable scope of being located, let alone monitored. [12N,16G]

**Response:** The revised regulations were not changed in response to this comment for the following reasons. The revised regulations require that the uppermost aquifer beneath the waste management unit be monitored. In cases where there is no uppermost aquifer [not even an ephemeral, seasonally saturated perched zone], then the ground water portions of revised Article 5 would not apply. However, there is usually some sort of aquifer beneath the unit, in the zone of saturation. If the shallowest ground water is in a perched zone that exists only for a short time after rainfall, then this perched zone can be monitored during those portions of the year when it will yield water to a monitoring well. Monitoring such wells for the presence of water during the dry season, for example, would give excellent early warning of a leak because such liquid could only have come from the unit. In addition, where water is very scarce small aquifers, even ephemeral perched zones, are valuable resources. In cases where water is found only at extreme depth, it should also be monitored but the ground water monitoring in such a case should be bolstered by an extensive unsaturated zone monitoring network because the great depth of the unsaturated zone will permit a considerable volume of waste to be released before the leak could be indicated at the ground water monitoring points. Therefore, neither of the conditions named by the commentor are an appropriate reason for eliminating ground water

monitoring. In cases where there is no water that could be adversely affected by a release from the unit, then there is no reason to monitor the unit; therefore, the question of how to apply Article 5 becomes moot.

### Section 2550.5(a)

#### Specific Purpose

The specific purpose of Subsection (a) is to establish the selection criteria and method of implementation for specifying the locations where monitoring is to be conducted.

#### Factual Basis

Subsection (a) retains the meaning and usage of the Subpart F "point of compliance", but with the clarification that the point of compliance extends from the edge of the waste management unit all the way down through the uppermost aquifer. This is the manner in which the Subpart F point of compliance is used by EPA, as outlined in one of their guidance documents [Chapters 2 and 3 of the USEPA's "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document", OSWER-9950.1, September 1986]; however, the clarification was necessary to make the meaning of the regulation self-evident. The Subpart F regulations focus upon the ground water medium and rely primarily upon wells placed at the point of compliance. Sections 2550 and 2555 of repealed Article 5 provided that monitoring points be placed in the unsaturated zone beneath the unit where feasible, in the ground water downgradient of the unit, and in all surface water bodies that could be affected by a release from the unit. This application was retained in Subsection (a) because monitoring should be carried out at all locations capable of providing a reliable indication of a release so that all potential pathways of migration from the unit are represented. This provision permits the regional board to require monitoring systems that will give the earliest obtainable indication of a release from the unit.

**Comments on Section 2550.5(a):**

**Comment:** The "point of compliance" is a misnomer because it isn't a "point" at all, but rather a vertical surface. [41L] Because the point of compliance is defined as "a vertical surface located at the hydraulically downgradient limit of the waste management unit that extends through the uppermost aquifer underlying the unit", it is not clear at which discrete depth the discharger is required to monitor. The repealed Article 5 language, which states that the point of compliance is the point where water quality protection standards are applied and where monitoring is conducted, should be retained. [48F]

**Response:** The regulations were not changed in response to this comment because this term is retained from 40 CFR 264.95 in order to demonstrate equivalency with those regulations, as required by Subsection 13172(d) of the Water Code. However, the wording was changed in response to this comment in order to clarify the requirements for the actual monitoring point. The discharger is responsible for detecting any releases that reach the point of compliance. In order to accomplish this, the discharger is required to place enough monitoring points along this vertical surface to be confident that any release passing the point of compliance will be detected. Therefore, the point of compliance is a conceptual vertical surface which is monitored at several points along its surface.

**Comment:** Aquifers below the uppermost aquifer could become contaminated as a result of discharge from the waste management unit. Therefore, the point of compliance should not be restricted to the uppermost aquifer. Perhaps the term "aquifer(s) of concern" could be substituted for "uppermost aquifer". [41M]

**Response:** The regulations were not changed in response to this comment because the last sentence of this subsection clearly provides that the regional board shall require monitoring points additional to those at the point of compliance where necessary to achieve the specific goals of the applicable monitoring and response program. Details are provided in Section 2550.7, which is also referenced in this sentence, concerning when the discharger should monitor other portions of the zone of saturation as well as zones of perched water. In addition, the definition of the uppermost aquifer includes any lower aquifers that are hydraulically connected to the nominal uppermost aquifer.



**Comment:** Locating the compliance point at the downgradient limit of the waste management unit is not always correct and the regional board should have the discretion to locate the compliance point elsewhere based upon site specific conditions, natural and engineered containment features, environmental control systems, and the need to meet specific water quality objectives or standards. [2G,26F]

**Response:** The regulations were not changed in response to this comment for the following reasons. The compliance point under 40 CFR 264.95(a) is located along the downgradient boundary of the unit because that is typically the location where wells are likely to provide the earliest possible indication of a release. Repealed Article 5 also enabled the regional board to establish other monitoring locations downgradient of the unit as necessary for detecting a release at the earliest possible moment [Section 2553(a)]. The language of revised Section 2550.5(a) combines the federal approach with that of repealed Article 5 by providing for a monitoring points at the compliance point along the downgradient unit boundary and additional monitoring points elsewhere as needed for providing the earliest detection of a release. This approach is in accordance with Porter-Cologne, which charges the State Board with promulgating regulations which protect beneficial uses of waters of the State.

**Comment:** Locating monitoring points at the hydraulically downgradient boundary of the waste management unit may, in some cases, compromise the integrity of the unit. [12M,16G]

**Response:** The regulations were not changed in response to this comment because the definition of waste management unit [Section 2601 of Chapter 15] includes any containment features and any ancillary containment features for precipitation and drainage control. Placing monitoring points hydraulically downgradient of such features will not cause damage to those features.

**Comment:** It is unclear how the regional board will specify the point of compliance and the monitoring points for each waste management unit. [18Q,25Q]

**Response:** The regulations were not changed in response to this comment because the regional board has more than sufficient

information to specify both the point of compliance and any additional monitoring points based upon the information required in the discharger's initial Report of Waste Discharge under Article 9 of Chapter 15.

**Comment:** This subsection requires the regional board to require that monitoring be conducted at locations other than the point of compliance, even where unnecessary to protect water quality. [36T]

**Response:** The regulations were not changed in response to this comment because, contrary to the comment, this subsection in conjunction with revised Section 2550.7 only enables the regional board to require monitoring at other (i.e., non compliance point) locations in instances where such additional monitoring would be useful in achieving the goal of the monitoring and response program being applied. The use of such additional monitoring points is often necessary because the hydrogeologic environment of the subsurface is far too complex at most sites to enable a release to be reliably indicated by compliance point wells working alone. Another consideration is that Subsection 2553 of repealed Article 5 required only that the monitoring points be hydraulically downgradient of the unit, not immediately downgradient as would be the case with the point of compliance. Therefore, repealed Article 5 enabled the use of monitoring points at other than the RCRA-style point of compliance. The revised regulations clarify this application rather than create it anew.

#### Section 2550.5(b)

##### Specific Purpose

The specific purpose of this subsection is to avoid damage to clustered existing waste management units.

##### Factual Basis

Under the corresponding Subpart F provision, a facility having more than one waste management unit may utilize a point of compliance common to all the units. It is the experience of the State Board staff that this approach can lead to poor monitoring performance where the several units are spread out across the

facility. The federal provision is, therefore, restricted in the revised regulations to permit a shared point of compliance only where the boundaries of the several existing waste management units are constructed such that the installation of monitoring systems for each individual unit could threaten the structural or containment integrity of one or more of the units. This requirement represents a clarification of Section 2553(c) of repealed Article 5, and is designed to assure monitoring systems capable of providing the earliest possible detection and measurement of a release.

An additional restriction is that this provision can only be applied to units that were established prior to the promulgation of this article, because the earliest possible detection typically comes through the use of a monitoring network that is specifically adapted to each waste management unit. Newly designed or constructed units can easily be provided with such individual attention, whereas it would be very difficult to retrofit many existing contiguous units in this way.

This provision addresses a shared point of compliance and should not be taken as a prohibition of having two or more units share one or more monitoring points, so long as each shared monitoring point is suitably situated to be of use to each of the units it is to serve, and so long as each unit has its own program.

**Comment on Section 2550.5(b):**

**Comment:** This section does not conform with either the federal or the state regulations which permit waste management units that are close together to share one ground water monitoring system. [28I,30E,30N,30X] Although the revised regulations provide broad discretion for the regional boards to impose additional ground water monitoring requirements without any assessment of the relative benefit, the revised regulations appear to restrict the regulatory flexibility if such flexibility can be justified on a case-by-case basis. For example, new language added to Subsection 2550.5(b) further restricts the ability of the regional board to allow the point of compliance to be located along the outer boundary of contiguous waste management units even if a discharger could establish a credible argument on a case-by-case basis that such a configuration was most desirable. [56J]

**Response:** The regulation was not changed in response to these comments for the following reason. Although the repealed

regulation [Section 2553(c)] did mention such an arrangement for units that are close together, the latter portion of that Subsection clearly stated that the regional board had the discretion to grant shared monitoring systems only to units which are contiguous [touching at one or more points]. The revised Subsection clarifies this portion of the regulations. Even in cases where units can share a ground water monitoring system, each unit must have its own individual monitoring program; therefore, this regulation does not incorporate the federal concept of a "waste management area" [e.g., monitoring a group of units as a single unit]. However, it should be noted that the discharge is not precluded by this or any other Subsection in the revised article from having a monitoring point to serve two or more waste management units at the same time, so long as the placement of that monitoring point is appropriate for monitoring each of the units and so long as each unit sharing that monitoring point has its own separate monitoring program.

**Comment:** It is not clear if the phrase "release from that unit" in Subsection (b) (2) refers to the clump of units or to specific unit within the clump of contiguous units. [29B]

**Response:** In response to this comment, the referenced language has been removed and the subsection rewritten to increase clarity. Dischargers are not allowed to monitor a group of units as if the group were a single unit [e.g., the federal "Waste management area" concept is not permitted]. Each unit is required to have its own monitoring program designed specifically to either detect or remediate releases from that unit in order to maximize the likelihood of detecting a release at the earliest possible moment and being able to isolate the source of the release.

**Comment:** For clarity, it should be stated that the requirements of this subsection only apply where technically feasible. since the water quality program for each unit must enable the earliest possible detection of a release from that waste management unit, the majority of facilities will be required to set the point of compliance around the perimeter of each unit, even if the units are contiguous. In existing facilities, it is likely that contiguous units are situated so close together that it would be impossible to place a monitoring well between them without compromising the integrity of the units. [27A57a] The phrase "if the water quality monitoring program for each unit will enable

the earliest possible detection of a release from that waste management unit." should be deleted from this subsection. [27A57b]

**Response:** The regulations have been changed in response to this comment by making the use of a shared compliance point available only to existing contiguous units that would be damaged by the installation of monitoring points along the downgradient boundary of each unit, by adding language requiring new units to be built such that each unit can have its own compliance point, and by deleting the performance standard referenced in the comment.

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**Section 2550.6. Compliance Period.****Specific Purpose**

The specific purpose of this section is to ensure that waters of the State are protected for as long as wastes in the unit, or released from the unit, pose a threat to water quality.

**Factual Basis**

A release from a waste management unit typically has many unpredictable time-related effects upon water quality, human health, and the environment. For example, in a hydrogeologic setting containing clay minerals, the rate of travel of the various constituents of the waste will be different because, among other factors, their speed will be retarded to differing degrees depending upon their individual susceptibility of adsorption onto the clay crystals. Under such conditions, some constituents could arrive at the downgradient well months or even years after the arrival time of the least-retarded constituents in the release. It is necessary, therefore, to provide a specified period of time during which monitoring and response programs will be required subsequent to a release in order to ensure that monitoring is conducted for a period which is long enough to allow detection of slower moving constituents. This section is based on 40 CFR 264.96. This section conforms to the corresponding federal regulation except for the generic changes specified in the introduction to this Statement of Reasons and in the article overview and as indicated below.

The length of the compliance period and the point in time when the compliance period is initiated are the same in the revised provision as required under the Subpart F regulations and are retained in the revised provision for purposes of consistency with the federal regulations. However, under the Subpart F regulations, the compliance period and the federal standard run concurrently, with the federal standard being in existence only for the duration of the compliance period. Under the revised regulations, a unit will always have a Water Quality Protection Standard [Standard], even when not in the compliance period. Therefore, the compliance period ceases to determine the longevity of the Standard and becomes simply the minimum number of years that the discharger must continue to monitor after discovering a release from the unit. In this context, the compliance period serves the purpose of assuring protection of water quality after a unit has been shown to be leaking by mandating that monitoring will be required for a minimum number

of years regardless of any corrective action measures taken by the discharger, including a clean closure [i.e., bodily removal of the unit, its contents, its appurtenances, and any underlying or adjacent materials that have been contaminated by a release from the unit].

Releases from classified waste management units generally pose a substantial threat to human health and the environment. In addition, the effects of a release are typically very long lasting and may not be immediately manifested due to the different rates of travel of the constituents in the release. Because it is not possible to reliably predict all potential effects of a release, it is essential that monitoring be conducted for a certain period of time subsequent to the discovery of a release in order to assure that slow-moving constituents or other late-manifesting effects of the release will be perceived and addressed. The wide variety of site-specific and waste-specific conditions make the establishment of any particular compliance period duration scheme somewhat arbitrary. However, the federal method of determining this duration is reasonable and there is no evidence at this time indicating that a longer duration is warranted. Hazardous constituents are to be found even in the leachate from most Class III units in the State, as evidenced by the results of the Solid Waste Assessment Test program. Therefore, the federal scheme for determining the length of the compliance period is retained and is applied to all classes of waste management units.

Under the revised article, a portion of the monitoring points for a waste management unit at which a leak is suspected or has been confirmed may be under either an Evaluation Monitoring Program or a Corrective Action Program, while those monitoring points that are not used in monitoring the release remain in the ongoing Detection Monitoring Program. This ongoing detection monitoring includes only those monitoring points that are not involved in evaluation monitoring or correction action. Therefore, under detection monitoring, any release detected at a monitoring point is likely to be a new release, even if there is a previous release that is undergoing evaluation or corrective action at another part of the waste management unit.

The discovery of any new release justifies restarting the compliance period at the unit because, as discussed above, the duration of the effects of a new release are likely to continue for many years and many effects will not be manifested at the monitoring points for a number of years after detection of the release. A new release is not an ongoing threat to water

quality; it a new threat. This provision is needed to assure that there will be a defined minimum number of years for monitoring the effects of any release, even after corrective action is completed for a previous release. Subpart F is not clear as to whether or not a compliance period is restarted each time the discharger leaves a Detection Monitoring Program [due to the discovery of a release]. Therefore, Subsection (b) is also necessary to clarify the applicability of Subsection (a) in cases where multiple releases have occurred.

Under Subsection (c), if the discharger's Corrective Action Program is unable to achieve compliance with the Standard by the scheduled end of the compliance period, then the compliance period is extended until the discharger has demonstrated that the Standard has been met throughout three consecutive years. It is necessary to extend the compliance period under such circumstances because the purpose of the compliance period under the revised regulations is to provide a minimum period of time for monitoring subsequent to a release. For a discharger ending corrective action prior to the end of the compliance period, revised Subsection 2550.10(i)(1) of this article requires a one-year proof period after stopping the corrective action measures. The discharger would continue in a Detection Monitoring Program until the end of the post-closure maintenance period, thereby providing additional time [beyond the mandated 1-year clean period] to assure that the corrective action was successful. On the other hand, if the corrective action takes so long that the compliance period must be extended for a unit, pursuant to Subsection (c) of this section, then a three-year clean period is required instead. The change from a one-year to a three-year clean period reflects the need under such circumstances to assure that no measures on the part of the discharger [e.g., clean closure] could terminate the monitoring of a unit that has just completed a corrective action unless the unit has demonstrated the effectiveness of the cleanup for a reasonable minimum number of years. This subsection retains the three-clean-year requirement in this circumstance from 40 CFR 264.96(c) because three years is a reasonable time for purposes of caution in guarding against the slower migration of pollutants to ground water after faster-moving pollutants have been cleaned up and because there is no evidence at this time that a longer clean period is needed.

**Comments on Section 2550.6:**

**Comment:** Subsections (a) and (b) of this section, when taken together, are confusing. In Subsection (b), the compliance



period begins when evaluation monitoring begins. However, in Subsection (a), it seems that the compliance period begins as soon as wastes are placed in the waste management unit. We suggest modifying Subsection (a) to state that the compliance period begins when the discharger initiates an evaluation monitoring program meeting the requirements of Section 2550.9 of this article and continues through the active life and closure period of the waste management unit. [48G]

**Response:** The regulations were not changed in response to this comment for the following reasons. Subsection (a) does not state when the compliance period begins. Instead, Subsection (a) specifies how long the compliance period will last, once it is started, and states that the purpose of the compliance period is to provide a minimum period during which monitoring is mandatory subsequent to the discovery of a release. The starting date for the compliance period is set forth under Subsection (b), which clearly states that the compliance period begins each time the discharger begins an Evaluation Monitoring Program [i.e., each time a new release is discovered]. A unit that never has an indication of a release will never initiate a compliance period. This compliance period is different from the compliance period used under repealed Article 5 [Section 2554] and this change is necessary in order to demonstrate equivalency with the federal Subsection 13172(d) of the California Water Code.

**Comment:** The compliance period should specifically include the post-closure period, as it did in the old regulations under Subsection 2550.6(a). [46G]

**Response:** The regulations were not changed in response to this comment because the commentor provides no valid reason to make such a change. A discussion of the reasoning behind the revised compliance period is provided in the introduction to this Statement of Reasons and in the Factual Basis for this section.

**Comment:** The three-clean-year period required under Subsection (c) of this section appears unnecessary and arbitrary based upon the Statement of Reasons. [42I]

**Response:** The regulations were not changed in response to this comment because staff has concluded that the justification for this time period is sufficiently well documented in the immediately foregoing portion of this Statement of Reasons [i.e., the Factual Basis for Subsection (c)].

**Comment:** This section provides no allowances for facilities that do not as yet have their Waste Discharge Requirements revised to meet the 1984 version of Article 5. [42H]

**Response:** The regulations were not changed in response to this comment because this section requires no phase-in period. However, revised Subsection 2550.0(f) contains a phase-in period which addresses the entire revised article and which applies to all waste management units currently under Waste Discharge Requirements.

**Comment:** The revised regulations should only require a compliance period for Class I waste management units, as per 40 CFR 264.96. Non-hazardous waste management units should have no compliance period and should have instead a post closure monitoring period that extends at least 30 years after closure because this is how the EPA's proposed Subtitle D regulations are set up. [18R] "Specifying an arbitrary compliance period based on active life and closure period is not technically related to evaluating a release. Requiring that compliance period to be written into Waste Discharge Requirements unnecessarily restricts the regional board. The compliance period should be established under the discretion of the regional board, should be based on the threat to water quality, and should last only as long as it takes to evaluate the release. This section is not necessary." [41N]

**Response:** The regulations were not changed in response to this comment because they are in accord with repealed Article 5 in this matter and because the Subtitle D regulations are not as yet promulgated and because the State Board has no mandate to avoid exceeding the stringency of the Subtitle D regulations when they are promulgated. In addition, the concept of the Compliance Period, as used in the revised article, differs from its use under the federal regulations in that it is simply an assured minimum number of years that monitoring will be required subsequent to a release from the unit. Therefore, this approach is suitable for all classes of units because it heads off the possibility that a unit that is known to have leaked could avoid monitoring through a clean closure or through other means. Continued monitoring is the only means through which the cleanup of a release can be validated, therefore, it is reasonable and necessary to provide a minimum period of time over which this function will be carried out subsequent to a release.

**Comment:** The attempt of this section to restart the 30-year monitoring time period each time the discharger enters an

Evaluation Monitoring Program is unnecessary to protect human health or the environment and is burdensome to the discharger. [18S,25S]

**Response:** The revised regulatory language was not changed in response to this comment for the following reasons. The comment is not consistent with the revised regulatory language because the compliance period is defined in this section as having a duration equal to the number of years in the active life and the closure period. There is no mention of any "30 year monitoring period", as referred to in the comment; neither is one inferred. Subsection (b) does state that the compliance period is restarted each time the discharger enters evaluation monitoring, but this is due to the fact that the only reason for entering evaluation monitoring is to evaluate the nature and extent of a new release. Both the complexity of subsurface hydrogeology and the lack of adequate data on it at most sites make the prediction of the fate and transport characteristics of a subsurface release a very inexact science, as are the choice and implementation of remedial measures. At this time, the success of a corrective action can only be demonstrated through a subsequent period of diligent monitoring. The compliance period serves in this capacity as a minimum time period during which monitoring is required subsequent to the discovery of a release. As such, it is just as appropriate to restart the compliance period in the event of a new release as it is to start the compliance period after the first release.

**Comment:** The reason for having the specified compliance period is not clear. [37M]

**Response:** The regulations were not changed in response to this comment because the reasoning behind the stipulation and use of this compliance period for all classes of waste management unit are presented with adequate clarity in the introduction to this Statement of Reasons and in the Factual Basis for this section.

**Comment:** In revised Subsection 2550.6(a), the parenthetical phrase "(including any waste...requirements)" should be placed after the phrase "the active life"; and the phrase "subsequent to a release from the unit" should be changed to "subsequent to a discharge to the unit". [37N]

**Response:** The regulations were not changed in response to this comment for the following reasons. The referenced parenthetical phrase modifies the noun phrase "the number of years" rather than the noun phrase "active life". The purpose of the compliance

period is to provide a minimum number of years that monitoring and response programs will be necessary after a release has been discovered, rather than after the first time waste is discharged to the unit.

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