

## MEMORANDUM

To: Lara Autry, US EPA

From: Raymond G. Merrill, Eastern Research Group, Inc.

Date: December 15, 2008

Subject: Draft 2008 Crosswalk between the OW Certification Manual and the TNI Environmental Laboratory Sector Accreditation Standard

The text and tables that follow are a comparison of EPA Office of Water's Fifth Edition (January 2005) Manual for the Certification of Laboratories Analyzing Drinking Water and the 2008 NELAC Institute (TNI) Standards for accreditation of environmental laboratories. As an addition to the review, ERG also provides input on whether TNI standards conform to the International Standards Organization (ISO) requirements in related areas. This review and comparison updates the previous comparison completed by Versar Inc. in May of 2006. We've summarized the major differences in the two programs below and we've also provided detailed tables describing the similarities and differences. If you have any questions or comments please feel free to contact me.

### **Comparison of TNI and OW Laboratory Assessment Standards**

The following tables present a comparison between the EPA Office of Water Fifth Edition (January 2005) Manual for the Certification of Laboratories Analyzing Drinking Water (OW CM) including Supplement 1 to the Fifth Edition of the Manual for the Certification of Laboratories Analyzing Drinking Water (EPA 815-F-08-006, June 2008) and the 2008 TNI Standards (December 2007).

Review and keywords searches were performed on the TNI Standards and the Supplement to the OW CM primarily. The previous comparison of OW CM certification standards performed by Versar was used to capture some of the original OW CM requirements that were not changed with the publication of the June 2008 supplement.

Tables are formatted with six columns identifying the:

- assessment subject,
- TNI citation,
- TNI Citation conformance to ISO 17025,
- OW CM citation,
- similarities and
- differences

“Not Found” as noted in the tables indicates that a requirement or topic in one assessment standard was not located in the comparison standard. If the TNI reference was found to be ISO/IEC 17011 or ISO/IEC 17025 compliant, this was noted in the appropriate column of the table.

The purpose of this comparison is to define the technical differences between the two programs. In doing so, the differences between the two programs can be evaluated by Environmental Laboratory Advisory Board (ELAB) to formulate advice to EPA on future improvements to laboratory compliance or accreditation programs. This effort will in turn provide information needed to improve the National

Program for laboratory accreditation and promote a single onsite inspection and assessment process rather than the current certification process requiring independent multiple states assessment.

With the recent update to the TNI Standards and the Supplement to the OW CM, the two standards moved toward the goal of a unified process for certification or accreditation. The recent Supplement to the OW CM refers to TNI. Also the TNI standard update includes some SWDA-based requirements from the drinking water program.

The organization of the contents of the OW CM and TNI Standard differ. Chapters in the OW CM include an Introduction (I), Responsibilities (II), Implementation (III), Critical Elements of Chemistry (IV), Critical Elements of Microbiology (V), and Critical Elements of Radiochemistry (VI). The updated TNI standard consists of 4 Volumes, two of which contain a number of Modules.

The TNI volumes cover laboratory assessment requirements for more than drinking water laboratory assessment (e.g., solid waste, air). The first volume of the TNI standard entitled "Volume 1, Management and Technical Requirements for Laboratories Performing Environmental Analysis," contains Module 1 (Proficiency Testing), Module 2 (Quality Systems General Requirements), Module 3 (Quality Systems for Asbestos Testing), Module 4 (Quality Systems for Chemical Testing), Module 5 (Quality Systems for Microbiological Testing), Module 6 (Quality Systems for Radiochemical Testing), and Module 7 (Quality Systems for Toxicity Testing). Volume 2, General Requirements for Accreditation Bodies Accrediting Environmental Laboratories, contains Module 1 (General Requirements), Module 2 (Proficiency Testing), and Module 3 (On-Site Assessment). Volume 3 is General Requirements for Environmental Proficiency Test Providers. Volume 4 is General Requirements for an Accreditor of Environmental Proficiency Test Providers.

Both standards are valid approaches to assess laboratories and improve quality programs in laboratories analyzing environmental samples. The OW CM is more focused on drinking water programs and requires a laboratory to adhere to the quality control defined by the method and to prepare a quality plan that reflects that control. No attempt has been made to summarize the quality requirements in OW methods or to compare the method specific requirements with the TNI standard. Therefore, some of the differences noted in the two standards may be accounted for in the OW methods.

TNI requires a quality system and a quality manual (however named) that documents the system. The TNI standard requires laboratories to meet requirements in the contract they sign with their client(s). If specific quality requirements are not listed in the contract then the quality requirements in the methods coupled with the laboratory's Quality Plan have primary authority for setting specific quality requirements during sample analysis. OW CM certification are restricted to meeting the quality requirements in prescribed methods for drinking water in contrast to TNI which has greater scope and is geared toward the needs of individual clients and their data quality requirements. Therefore, differences between the OW CM and TNI standards related to specific QC requirements listed in the methods are of less importance than the broader program requirements for each group.

TNI standard tends to require more documentation and detail on QA/QC requirements since there is no standard set of methods to reference. TNI accreditation evaluates laboratories on their quality program responding to client or contract agreements and the methods referenced in the contract agreements. OW CM evaluates laboratories on the performance of reference methods which contain the body of QC details required by the program.

The education and experience required for the personnel who perform methods evaluated by either of the two assessment approaches (manuals) a significant different. The OW CM provides more detail on individual positions and education/experience levels in the method sections. Other than the technical

manager, TNI does not provide education or experience requirements for laboratory personnel. TNI focuses on documentation of qualifications for analysis and demonstration of proficiency by the laboratory analysts rather than formal education and degrees.

Documentation required from a certified or accredited laboratory is a topic where the two manuals have significant differences. The TNI requires much more documentation than the OW CM. Differences include the TNI requirement for a comprehensive Quality Manual for laboratory operation and responsibility for program management. The OW requirement for a Quality Plan is much more like a project specific project plan. While the OW requirement can include all that the TNI standard requires, the OW CM does not list in detail the requirements for either the Quality Plan or method SOPs.

TNI does not address several important topics to the drinking water program covered by OW such as Principal State Laboratories, Interim Certification, reciprocity, and numerous method specific technical details.

The two approaches also differ in several non-technical areas. OW CM does not discuss subcontracting, management reviews, internal audits, data integrity training, electronic transmission of results, preventative action, and client confidentiality, TNI includes specific requirements for each of these topics.

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Subject	The NELAC Institute (TNI) Standard Reference	ISO Reference	OW/Drinking Water Laboratory Certification Program (DWLCP) Reference	Similarities	Differences
<b>Implementation</b>					
Document Titles			Manual for the Certification of Laboratories Analyzing Drinking Water and Supplement 1 to EPA 815-R-05-004		
Evaluation of Certification Program***	Environmental Laboratory Sector TNI Standards Adopted December 22, 2007 Management and Technical Requirements for Laboratories Performing Environmental Analysis		III.1	Similar sections, different programmatic roles. The Office of Water Certification Manual (OW CM) and the NELAC Institute (TNI) Standard both describe the roles, the responsibilities, and the structures of their respective programs.	Differences in the standards reflect the differences between the overall programs. TNI Standard outlines aspects of its program in greater detail than OW CM.
Requirements for Certification of Laboratories	EL-V1M1-2008 Section 4.0, EL-V2M2-2008 Sections 5.1.1, 5.2.1, 5.2.3,  EL-V2M3-ISO-2008 Section 5.1		III.2	Both require Proficiency Test (PT) samples, Programs differ on the initial and ongoing requirements.	OW CM requires passing a PT for each analyte/each method once a year. The National Environmental Laboratory Accreditation Conference Institute (TNI) standard, handles PTs in much more detail. TNI has differing requirements for initial (2 successful PTs for each matrix, technology/method, and analyte), continuing (2 successful PTs per

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					year for each matrix, technology/method, and analyte), and experimental PTs (2 PTs for each matrix, technology/method, and analyte).
Requirements for Certification of Laboratories	EL-V1M1-2008 Section 4.0, EL-V2M2-2008 Sections 5.1.1, 5.2.1, 5.2.3, EL-V2M3-ISO-2008 Section 5.1		III.2	Both programs require onsite assessment.	Programs differ regarding on-site audit frequency; OW CM requires once every three years with questionnaires given on other years, TNI requires onsite assessment once every two years.
Individual(s) Responsible for the Certification Program	EL-V1M1-2008 Section 3.1, EL-V2M1-ISO-2008 Section 3.2	ISO/IEC 17011	III.3	Each program has officers or authorities empowered to certify or accredit laboratory programs.	The program structures also differ slightly by definition and duties of authorities within the program. OW CM has Certification Authority (CA), Certification Program Manager (CPM), and Certification Officers (CO) that may represent the state and regional personal. TNI Standard has Accreditation Bodies whose authority is generally derived from regulatory authority acceptance of the accreditation process.
On-Site Laboratory Audit Team	EL-V2M3-ISO-2008 Sections 4.2.3, 4.2.4, 4.2.5		III.4.1	Both programs require appropriate education/training.	OW CM requires that auditors have a Bachelor's degree or equivalent education/experience in the field they certify. OW CM requires that the CO complete the appropriate EPA laboratory training course. OW CM has no requirement for

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					<p>supervised assessments. TNI states an assessor shall hold at least a Bachelor's degree in a scientific discipline or have commensurate experience acquired by having performed verified assessments of environmental laboratories, and have completed and attained a passing score on the written examination of courses approved by the employing accreditation body on assessing quality systems and all technical disciplines comprising a technology or combination of method and technology that the assessor will assess. Also states that an assessor needs to have participated in one or two on-site assessments under the supervision of a qualified assessor before performing an unsupervised assessment.</p>
Third Party Auditors	EL-V2M1-ISO-2008 Sections 3.1, 7.4.2	ISO/IEC 17011	III.3, III.4.2, Appendix D	Both standards state the Accreditation Body (AB) may use a third-party assessor if outside expertise is required, so long as the body verifies the third party is free of conflict of interest and competent to perform the assessment.	Appendix D of the OW CM manual discusses EPA's policy on third party auditors and potential for conflict of interest. TNI takes full responsibility for all subcontracted assessments and assess the potential for conflict of interest.

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Plans for Certification of Laboratories and Certification Process	EL-V2M1-ISO-2008 Sections 4.6, 7.7.2	ISO/IEC 17011	III.5, III.7	OW CM's CPM and TNI 's AB have similar responsibilities for planning assessments.	The TNI standard has pre-specified procedures for certification. These procedures are detailed for the laboratory in Volume 1 and Volume 2. OW CM refers to CPM as the individual responsible for developing and recording certification plans, schedules, etc. A similar comparison can be made to a TNI Assessment Board (certifying, auditing, and auditing record keeping elements), who establishes the plans and procedures for on-site assessments. The OW CM process is less prescriptive, using terms like should and may. The OW program allows the CPM to make program decisions based on the audit assessment.

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Principal State Laboratories (Laboratories that have available facilities capable of performing analytical measurements for all federally mandated contaminants specified in the State Primary Drinking Water Regulations)	Not Found		III.6	No	TNI omission.
Terminology: Certified vs. Accredited	EL-V1M1-ISO-2008 Section 4.0		III.8.1	Both programs address laboratory assessment.	TNI uses the term accredited, OW CM uses the term certified. TNI stipulates differences between the accreditation process of initial and continuing accreditation. Participation in the TNI process is voluntary.
Provisionally Certified	EL-V2M1-ISO-2008 Section 3.0, EL-V1M1-ISO-2008.1 Section 3.0	ISO/IEC 17011	III.8.2	Both programs address performance and nonperformance issues in laboratories.	TNI uses the term suspension- the laboratory can not perform analysis for which field it is suspended. OW CM allows the laboratory to conduct the analysis if the client is aware of its certification status, unless the evaluation team believes that the laboratory can perform the analysis within acceptable limits. TNI provides additional causes for suspension (i.e. failure to maintain a quality system); OW CM lists the



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					cause as being deficiencies either in PT studies or on-site visits. TNI- The status can be reversed if compliance is demonstrated to the primary AA. TNI also mentions the right to due process.
Not Certified	EL-V2M1-2008.1 Sections 7.5.6.1, 7.9, EL-V2M2-2008.1 Section 10.0		III.8.3	Both programs state that deficiencies prevent laboratories from becoming certified.	OW CM states that a laboratory is not certified if it has deficiencies and cannot produce valid data. TNI includes an outline of deficiencies that prevent a laboratory from becoming accredited. It also categorizes these deficiencies in three categories: suspended, withdrawn, or reduced accreditation. TNI mentions due process. Due process in reference to certification status is not discussed in OW CM, but in other sections it does state that the laboratory has the right to be heard by EPA.
Interim Certification	Not Found		III.8.4	No	OW CM states that an on-site audit should be made as soon as possible but not later than 3 years after an interim certification is granted.
Drinking Water Laboratories	EL-V1M6-2008 Section 1.5.2.2 (MDL)		III.9	Both programs require methods that meet the client's requirements.	OW CM-Laboratories that analyze drinking-water samples for Safe Drinking Water Act (SDWA) compliance monitoring shall use methods whose detection limits

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					meet the requirements of 40 CFR 141. Although TNI does not have specific subsections or sections dealing with this exact subject matter, TNI does stipulate that laboratories must meet federal agency requirements, and the requirements of the methods they use, which would include the Safe Drinking Water Act.
Laboratory Quality Assurance Plan	EL-V1M2-2008 Sections 4.2.2, 5.9		III.11	OW CM recommends a quality plan, TNI requires a quality plan.	OW CM-laboratory must adhere to the quality control required by the methods and should prepare a quality plan, while TNI requires a quality system and quality manual (however named). OW CM does not require that QA Plan format include an identifier, page number, etc. OW CM does not state that the QA Plan contain information on review of new work requests, a policy for deviations from documented procedures or method specifications. OW CM does not state that major equipment or electronic signatures be included in the QA Plan. Nor does it state that procedures for dealing with complaints or protecting confidentiality be included.
Laboratory	EL-V1M2-ISO-2008	ISO/IEC	III.11.1	Programs are similar for	Other than the Technical Manager,

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organization and responsibility	Section 4.1, 4.2, 5.2	17025		technical management and QA management.	TNI does not specify positions or type/amount of education, experience, and/or training needed, only “appropriate”. Waiver of academic training is also not discussed in the TNI standards. OW CM does not indicate whether the person responsible for preparing a document may or may not review the report for final release. OW CM describes the internal audit process through a certification program. OW CM does not specifically state that laboratory personnel can conduct internal audits to check compliance with certification or accreditation standards.
Methodology	EL-V1M2-ISO-2008 Section 5.4		III.13.2	Both programs require methods that meet client requirements.	OW CM requires Federal Reference Methods listed in specific sections of IV, V, I (and specified in 40 CFR part 141). TNI states that methods published in international, regional, or national standards shall preferably be used, but that the laboratory use methods which meet client requirements.
On-Site Evaluation	EL-V2M3-ISO-2008 Sections 5.0, 6.0	ISO/IEC 17011, most of Section 6.0 is	III.13.3	Both programs require onsite assessment.	OW CM suggests that an on-site assessment be conducted once every three years and sooner if the laboratory previously did not do

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		ISO/IEC 17011			well during an audit or has had a major change. For TNI , the interval between the surveillance on-site assessments should not exceed 2 years, with the first surveillance on-site assessment carried out no later than 12 months from the date of initial accreditation.
Notification of Certifying Authority (CA) of Major Changes	Not Found		III.13.4	No	TNI does not require accrediting authority be notified that major changes have occurred. TNI requires changes be documented in the appropriate laboratory documents.
PT Criteria	EL-V2M1-ISO-2008 Section 7.0	Most of TNI Standard Section 7.0 is ISO/IEC 17011	III.14.1, 14.2	Both programs require PT sample analysis as a means to evaluate laboratory conformance to the standard.	TNI requires the laboratory to conduct two PT studies for each field of proficiency testing per year for “matrix-technology/method-analyte/analyte group”. OW CM requires PT samples to be analyzed at least annually for “regulated contaminants for which they wish to be certified, by each method for which they wish to be certified (OW CM I Introduction)”.
Certification or Accreditation Status Review	EL-V2M1-ISO-2008 Section 7.0		III.14.1, 14.2	Both programs use PT performance as a means to downgrade certification or accreditation status.	OW CM states that a laboratory should be downgraded to provisionally certified, whereas, TNI may suspend a laboratory for failure to comply with PT analysis

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					<p>requirements. An OW CM laboratory may continue to do work but have to note suspension in writing on any report. A TNI accredited laboratory can not continue as a certified laboratory after failure to comply and suspension. Both TNI Standards and OW CM specify their own procedures and criteria for downgrading/revoking certification status. TNI and OW CM both require analysis of PTs and penalize for falsification; but TNI provides more detail. TNI mentions due process, OW CM states that EPA or the state provide technical assistance to help identify and resolve the problem. TNI discusses other aspects like personnel requirements that may cause suspension, OW CM does not.</p>
Criteria/ Procedures for Revocation	EL-V2M1-2008.1 Sections 7.5.6.1, 7.9.1, 7.9.4.2, EL-V2M2-2008.1 Section 10.0		III.14.3, 14.4	Both programs have procedures for revocation of certificates.	OW CM states that a laboratory is not certified if it has deficiencies and cannot produce valid data. TNI lists the deficiencies that lead to revocation. TNI mentions due process. Due process in reference to certification status is not discussed in OW CM, but in other sections is does state that the

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Upgrading or Reinstatement of Certification	EL-V1M1-2008.1 Section 8.0, EL-V2M1-2008.1 Section 7.9.5		III.14.5	Both standards require the facility to pass accreditation status before upgrading or reinstatement can be done.	laboratory has the right to heard by EPA. OW CM requires a written request from the laboratory seeking upgrading or reinstatement of certification. TNI-requires the laboratory to meet the requirements for continued accreditation to be reinstated after suspension, . Under TNI, to reinstate accreditation after revocation, the laboratory must meet the requirements for initial accreditation.
Record Keeping	EL-V1M2-ISO-2008 Section 4.13	ISO/IEC 17025	III.15	Both programs address records maintenance.	OW CM states that records should be maintained for a minimum of 6 years and TNI states a minimum of 5 years. OW CM addresses that the record keeping procedures should be documented in the QA Plan. TNI requires that a laboratory establish a record keeping system that allows the history of the sample and associated data to be readily understood through the documentation. TNI includes records of subcontractors, disposal of records, legibility, and storage environment, preventing unauthorized access, archiving files, naming files, or overwriting/obliterating old files,

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					electronic data storage, whereas OW CM does not.
Reciprocity	Not Found		III.16	No	Although TNI does support reciprocity between states and regions, no statement was found in the standard regarding reciprocity.
Alternate Test Procedures (ATPs)	EL-V1M4-ISO-2008 Section 1.5.3.d		III.18	Non-standard methods must be validated for certification in both programs.	The OW CM requires new methods or modified methods be approved by the EPA via written submission. TNI only requires that the new/modified method be validated through laboratory analysis and documented for their review. TNI offers Tier I, Tier II, and Tier III requirements in US EPA Office of Water's Alternate Test Procedure (ATP) as a possible approval process.

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<b>PT Studies, and Use of Accreditation</b>					
Analysis of PT samples and use of own laboratory PT results	EL-V1M1-2008.1 Section 5.1		III.13.1, III.14.3, IV.7.2.1, V.7.2, VI.7.2	Both TNI and OW CM state that the PT sample shall be analyzed in the same manner as routine samples.	OW CM also states that the laboratory should be able to provide documentation that the person analyzing the samples is a laboratory employee who routinely analyzes drinking water compliance

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<b>PT Studies, and Use of Accreditation</b>					
					<p>samples.  TNI lists actions that should not be taken with PT samples, such as subcontracting, analyzing PT samples for other labs to gain accreditation, obtaining results from PT providers, or discussing PT results with other labs. OW CM does not discuss these issues.</p>

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<b>Organization</b>					
Legal responsibility	EL-V1M2-ISO-2008 Section 4.1.1, EL-V2M1-ISO-2008 Section 4.1		IV.8.1, V.8.1, VI.8.1	No	The OW CM does not discuss the legal responsibility of the accreditation body. TNI states that the accredited laboratory or organization can be held legally responsible. It also discusses the legal responsibility of the AB.
Activities carried out according to a defined standard	EL-V1M2-ISO-2008 Section 4.1.2		II	Both programs require activities performed to the standards.	OW CM states that the EPA encourages the States to base certification of drinking water laboratories either upon criteria contained in the manual or upon state-developed equivalents that are at least as stringent as the manual. TNI states that laboratories should carry out activities in such a way as to meet the requirements of this International Standard and to satisfy the needs of the customer, the regulatory authorities or organizations providing recognition.
Instrument testing & calibration.	EL-V1M2-ISO-2008 Section 4.1.2		III.11.6 (calib.), III.11.2 (client objective)	Both programs have requirements for calibration.	TNI requires laboratories to perform testing in such a way to meet the needs of the client and regulatory authorities or organizations. OW CM states that the QA Plan should include processes to identify clients' data quality objectives (DQOs). OW CM presents QC such as calibrations as method-specified.

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<b>Organization</b>					
					TNI requires laboratories to perform calibration in such a way to meet the needs of the client and regulatory authorities or organizations.
Quality system	All of EL-V1M2-ISO-2008, EL-V2M1-ISO-2008 Section 5.7.4	Most of the V1M2 (if not all) is ISO/IEC 17025	III.2, III.11, IV.7, V.7, VI.7	With the Supplement to OW CM, both standards require a quality system to be implemented.	TNI requires that the effectiveness of the required quality system be reviewed in the annual internal audit.
Management system that covers other facilities (temp. or mobile)	EL-V1M2-ISO-2008 Section 4.1.3	ISO/IEC 17025	III.11.4	Both standards require the management system to cover temporary facilities of all types.	OW CM does not discuss management of mobile or field activities, however it does describe the similar concept of field work throughout the standard. TNI -The management system shall cover work carried out in the laboratory's permanent facilities, at sites away from its permanent facilities, or in associated temporary or mobile facilities.
Conflict of interest (between data quality/compliance with other topics)	EL-V1M2-ISO-2008 Section 4.1.4, EL-V2M1-ISO-2008 Section 7.4	ISO/IEC 17025,ISO/IEC 17011	Appendix D	Both standards emphasize the importance in preventing conflicts of interest between the laboratory and the accrediting body.	TNI-The accreditation body, shall identify, analyze and document the relationships with related bodies to determine the potential for conflict of interest, whether they arise from within the accreditation body or from the activities of the related bodies. Where conflicts are identified, appropriate action shall be taken. OW CM- Conflict of Interest is found in Appendix D addressing sensitivity to potential conflict of interest, but no real discussion of conflict of interest.

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<b>Organization</b>					
Personnel with authority and resources to carry out work and see deviations from quality system	EL-V1M2-ISO-2008 Sections 4.1.5.a, 4.1.5.b, 4.1.5.h	ISO/IEC 17025	III.10.2 and III.10.3	Programs are similar although worded differently.	TNI discusses that the laboratory must have technical management who have the authority and resources to carry out work and see departures from the management system and initiate preventive actions. OW CM states the QA Manager should be independent from lab management and have access to senior management.
Protect client confidentiality and storage of data	EL-V1M2-ISO-2008 Sections 4.1.5.c, 4.7.1, 5.4.7.2	ISO/IEC 17025	IV.8.2, V.8.2, VI.8.2	No	OW CM does not discuss client confidentiality, but does discuss reporting stored results to clients before removal. TNI discusses protecting confidential information, both discuss records retention.
Ensure internal and external pressure does not affect personnel	EL-V1M2-ISO-2008 Section 4.1.5.b	ISO/IEC 17025	Not Found	No	TNI-(4.1.5.b) have arrangements to ensure that its management and personnel are free from any undue internal and external commercial, financial and other pressures and influences that may adversely affect the quality of their work; OW CM does not discuss the issue of internal and external pressure that would impede on competence, integrity, or impartiality.
Organization (lab and larger entity) structure and job specification of personnel	EL-V1M2-ISO-2008 Sections 4.1.5.e, 4.1.5.f, EL-V1M2-ISO-2008 Section 4.0	ISO/IEC 17025	III.11.1	Both standards mandate that the laboratory structure and personnel job specifications should be outlined in the Management Plan (TNI) or Quality Assurance Plan (OW CM.)	

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<b>Organization</b>					
<p>Adequate supervision, supervision by personnel who are familiar with test. Technical managers document personnel qualifications?</p>	<p>EL-V1M2-ISO-2008 Sections 4.1.5.g, 4.1.5.h</p>	<p>ISO/IEC 17025</p>	<p>III.10.2, IV.1.1, V.1.1, VI.1.1</p>	<p>Both programs have specifications for personnel performing analysis. Neither standard indicates whether or not a technical manager documents personnel qualifications.</p>	<p>OW CM supervisors and personnel working at a specific type of lab (chemist, micro., and radio.) have their specifications of education etc. listed under appropriate section. TNI standard 5.2.6.1 for technical managers requires a BS with 24 credit hours in chemistry and 2 years in analysis, a year experience or masters/doctorate. OW CM does not have credit hour requirements in chemistry or analysis. TNI technical managers of limited laboratories (covering only one field) have an associate's degree in specific type with 16 hours college credit hours and 2 years in analysis in appropriate field.</p>
<p>QA manager who is independent but has access to upper management</p>	<p>EL-V1M2-ISO-2008 Sections 4.1.5.i, 4.1.7.1</p>	<p>ISO/IEC 17025</p>	<p>III.10.1-3, III.11</p>	<p>Both standards ask that quality assurance managers have direct access to upper management and be independent from the management.</p>	<p>OW CM does not indicate whether or not the QA manager has functions independent from laboratory operations for which they have QA oversight. It does state that the QA manager should be independent from the laboratory management, if possible. The OW CM plan does not state that the QA manager is responsible for conducting internal audits or for corrective actions (section III.11 indicates that the QA plan should state who that person is). TNI does not specify that the QA manager needs to have a bachelors degree</p>

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					and a year of experience in quality assurance. OW CM supervisors and personnel working at a specific type of lab (chemist, micro., and radio.) have their specifications of education etc. listed under appropriate sections. The OW CM document does not elaborate on the specific requirements of the QA manager position. TNI states that the technical director may also be the QA manager; (the QA manager has functions independent from laboratory operations for which they have QA oversight (4.1.7.1.b)).
Appoint deputies for key managerial personnel like the technical director and quality manager	EL-V1M2-ISO-2008 Section 4.1.5.j	ISO/IEC 17025	Not Found	No	TNI requires the laboratory to appoint deputies for key managerial personnel (NOTE: Individuals may have more than one function and it may be impractical to appoint deputies for every function). OW CM plan does not discuss appointing deputies for key management staff.
PT Testing	EL-V1M1-2008.1, EL-V2M2-ISO-2008		III.13.1, III.14, IV.7.2.1, V.7.2, VI.7.4	Both require PT testing and obtaining PT samples from acceptable certification suppliers.	TNI -Volume 1, Module 1 provides the requirements for laboratory participation in the TNI Proficiency Testing (PT) program. To obtain initial accreditation, the laboratory shall successfully analyze two unique TNI compliant PT samples (FoPT) for each field of accreditation being sought. The

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Organization</b>					
					laboratory must obtain PT samples from a PTOB/PTPA approved PT provider. The results from the PT studies must be returned to the PT provider for analysis. The accrediting authority (AA) should have access to the results of the PT testing. OW CM-sites a CFR for maintaining certification status through proficiency testing. Drinking water labs must satisfactorily analyze a PT sample at least annually for chemical contaminants. The lab must obtain PT samples from a supplier acceptable to the appropriate certification authority (CA).

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Quality System</b>					
Quality Assurance	EL-V1M2-ISO-2008 Section 5.9, individual technical modules	ISO/IEC 17025	III.11, IV.4.5, V.7, VI.7	Both include specific QA in individual method sections.	In general, OW CM specifies that laboratories should maintain a Quality Assurance Plan and lists the topics for inclusion in the plan. QA is discussed throughout the TNI document with requirements for a quality management plan for the laboratory operation. (Section EL-V1M2-ISO-2008 Section 5.9) as a technical requirement of

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Quality System</b>					
					accreditation.
Laboratory documentation to ensure quality	EL-V1M2-ISO-2008 Sections 1.1, 4.2.2	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	Quality documentation is required: OW CM's QA Plan, TNI 's QA Manual	OW CM states that laboratories must adhere to the method required QC and document these activities in a QA Plan. TNI states the laboratory's management system policies related to quality, including a quality policy statement, shall be defined in a quality manual (however named). OW CM suggests a QA Plan, whereas TNI requires a QA Manual.
Objectives included in QA plan	EL-V1M2-ISO-2008 Sections 4.2.2, 4.2.8.3.g, 4.2.8.3.h	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	No	TNI standard indicates that a quality policy statement should be issued under the authority of top management. OW CM QA Plan does not include the laboratory's objectives but requires project data quality objectives per EPA QA/R-5.
Quality manual inclusions	EL-V1M2-ISO-2008 Sections 4.2.2, 4.2.5, 4.2.6, 4.2.8.3, 4.2.8.4	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	Both list the required inclusions.	The OW CM does not have specific title page and table of contents instructions, TNI does. OW CM does not state that the quality manual should state the structure of QA plan. OW CM does not state that the QA manual should provide a reference of exceptions from the manual for managers to follow. TNI requires exceptions to be referenced or documented: 4.2.8.4.m).
Manual should include responsibilities of the QA manager.	EL-V1M2-ISO-2008 Sections 4.2.6, 4.2.8.2	ISO/IEC 17025	III.11.1 and III.10, IV.7, V.7, VI.7	Both include responsibilities of the QA manager.	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Quality System</b>					
List schedules of internal and external system and data quality audits and interlaboratory comparisons	EL-V1M2-ISO-2008 Sections 4.0 (interlab comp), 4.1.7.1.f, 4.11.5, 4.14, 4.2.8.4.c	ISO/IEC 17025	III.11.10	Both programs have requirements for internal QA checks.	OW CM states that the QA Plan should list schedules of internal and external system and data quality audits and interlaboratory comparisons (may reference SOP). TNI states the quality manual shall contain or reference verification practices, which may include interlaboratory comparisons, proficiency testing programs, use of reference materials and internal quality control schemes (4.2.8.4.c)

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Document Control</b>					
Control of all documents in the quality system	EL-V1M2-ISO-2008 Section 4.3	ISO/IEC 17025	III.11 (intro)	Yes	
Revision status of QA manual	EL-V1M2-ISO-2008 Sections 4.2, 4.3.2.1, EL-V2M1-ISO-2008 Section 5.7.4	ISO/IEC 17025	III.11 for QA plan and III.11.3 for procedures	Both programs require review and update of the QA manual/plan.	The OW CM manual requires annual review of both the QA plan and all SOPs. TNI requires an annual review of the quality manual during the internal audit. TNI also requires identifying the current revision, which OW CM does not address.
Specification of outdated/function/availability of QA manual	EL-V1M2-ISO-2008 Section 4.3.2.2	ISO/IEC 17025	III.11, IV.7.1.1, V.7.1.1, VI.7.1.1	No	OW CM does not have a requirement that deals with handling invalid manuals once revisions are conducted. Section



Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Document Control</b>					
					III.11 simply states that it is the responsibility of the QA manager to conduct periodic revisions of the manual and make sure appropriate information is always included. TNI has defined procedures for handling obsolete documents.
Identification of QA Manual documents and ID type text	EL-V1M2-ISO-2008 Sections 4.3.2.3, 4.3.3.2	ISO/IEC 17025	III.11	No	The OW CM manual does not specifically state that QA manuals should include an identifier, page number, etc as required in EPA QA/R-5. OW CM requires the date of last revisions of SOPs. TNI recommends QA Plan document format with identifier, page number, revision, etc.
Review of documents (who and do they have references)	EL-V1M2-ISO-2008 Sections 4.1.7.1, 4.3.2, 4.3.3.1	ISO/IEC 17025	III.11.1	No	TNI-Changes to documents shall be reviewed and approved by the same function that performed the original review unless specifically designated otherwise. The designated personnel shall have access to pertinent background information upon which to base their review and approval (4.3.3.1).
Altered text highlighted and hand amendments, process for changing electronic documents	EL-V1M2-ISO-2008 Sections 4.3.3.2, 4.3.3.3, 4.3.3.4	ISO/IEC 17025	III.11.5, III.11.13, IV.8.2, IV.8.6, V.8.2, VI.8.2, VI.8.6	No	OW CM has control of electronic data throughout, however does not address altered text in electronic documents or QA documents. TNI requires the altered or new text to be identifiable in the document or the appropriate attachments (4.3.3.2). As well as, procedures to describe how changes in documents

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Document Control</b>					
					maintained in computerized systems are made and controlled (4.3.3.4).

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Review of Requests, Tenders and Contracts</b>					
Reviews	EL-V1M2-ISO-2008 Section 4.4	ISO/IEC 17025	Not Found	No	CM OW does not address review of contracts. TNI discusses it in detail.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Subcontracting</b>					
Subcontracting	EL-V1M2-ISO-2008 Section 4.5, EL-V2M1-ISO-2008 Section 7.4, EL-V2M3-ISO-2008 Section 6.2	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	OW CM does not discuss the issue of subcontracting.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Purchasing Services and Supplies</b>					
Procedures for purchasing, reception, and storage of	EL-V1M2-ISO-2008 Section 4.6, EL-V1M2-ISO-2008	ISO/IEC 17025	VI.7	No	In the radiochemistry method of the OW CM, it is stated that the QA program should encompass the

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Purchasing Services and Supplies</b>					
reagents and standards	Section 5.6.4.2				purchase of supplies. This is the only mention of a purchasing procedure in the OW CM. TNI requires a laboratory policy/procedure for the selection and purchasing of services and supplies.
Chain-of-Custody Procedures	EL-V1M2-ISO-2008 Sections 5.8.7.4, 5.8.7.5, 5.8.8, EL-V1M3-2008 Section 1.7.8.1	ISO/IEC 17025	III.12, Appendix A	Both discuss chain-of-custody procedures.	OW CM gives a detailed example of the chain-of-custody procedure in Appendix A. TNI also contains a detailed requirement for COC.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Service to Client</b>					
Laboratory service to client and confidentiality	EL-V1M2-ISO-2008 4.7, EL-V2M1-ISO-2008 4.4	ISO/IEC 17025, ISO/IEC 17011	III.11.2	No	OW CM has "Process used to identify clients' Data Quality Objectives" listed as a QAP inclusion, but provides no details on the confidentiality or laboratory response to client complaints. TNI requires a laboratory to cooperate with the client, monitor their performance in relation to the work performed for that client, and provide confidentiality.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Control of Nonconforming Environmental Testing and/or Calibration Work</b>					
Policy and procedure for nonconformity with own procedures	EL-V1M2-ISO-2008 Sections 4.9, 4.11, EL-V2M1-ISO-2008 Sections 5.5, 5.6	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	TNI requires laboratories to have a policy/procedure to implement in the event of work that does not conform to testing procedures. OW CM does not require such a policy.
Action required for nonconformance	EL-V1M2-ISO-2008 Section 4.11, EL-V2M1-ISO-2008 Section 5.5	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	TNI requires laboratories to have a policy/procedure to implement corrective actions when work does not conform to testing procedures. OW CM does require a corrective action procedure in the laboratory QAP, but does not mention nonconformance.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Preventive Action</b>					
Preventive action	EL-V1M2-ISO-2008 Section 4.12, EL-V2M1-ISO-2008 Section 5.6	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	TNI requires laboratories to have a procedure to identify potential sources of nonconformity. OW CM does not require such a policy.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Control of Records</b>					
Record system	EL-V1M1-2008.1 5.3, EL-V1M2-ISO-2008 4.13,	ISO/IEC 17025 except Sect. 5.3	III.11.13, III.15, IV.8.2, V.8.2, VI.8.2,	Both include a list of required records. Both have a similar minimum length of	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Control of Records</b>					
	5.8.7(records are mentioned throughout Vol1)		IV.8.1, V.8.1, VI.8.1	record storage, OW CM: 6 years, TNI: 5 years.	
Data access and disposal procedures and other criteria	EL-V1M2-ISO-2008 Section 4.13	ISO/IEC 17025	III.5, III.11.12, III.15, IV.8, V.8, VI.8, III.11.13	No	OW CM does not describe disposal of records, legibility, and storage environment or procedures for preventing unauthorized access. OW CM does not have a set format for archiving files, naming files, or overwriting/obliterating old files. TNI discusses control of records in detail.
History of records	EL-V1M2-ISO-2008 Sections 4.13.3.a, 4.13.3.f	ISO/IEC 17025	Not Found	No	TNI requires laboratories to establish a record keeping system shall allow the history of the sample to be readily available.
Raw data	EL-V1M2-ISO-2008 Section 4.13.3.f.i	ISO/IEC 17025	IV.8.4, V.8.4, VI.8.4, IV.8.2, V.8.2, VI.8.2	Both programs discuss raw data management.	
Mistakes and alterations	EL-V1M2-ISO-2008 Section 4.13.2.3	ISO/IEC 17025	IV.8.3, V.8.3, VI.8.3, IV.8.2, V.8.2, VI.8.2	Yes	All records of analyses must be available for inspection by accrediting authorities. OW CM manual does not have this requirement.
Security of records	EL-V1M2-ISO-2008 Sections 4.13.3.f.xv, 4.13.3.e, 4.13.1.2, 4.13.1.3, 4.13.1.4	ISO/IEC 17025	IV.2, IV.8.2, V.8.2, VI.2.1, VI.8.2, III.11.8, III.11.13	Both require a suitable environment and security of electronic data.	OW CM provides general guidance for security and maintenance of data. TNI has specific requirements for confidentiality, security of data such as indexing of records and disposal procedures.
Samples	EL-V1M2-ISO-2008 Section 4.13.3	ISO/IEC 17025	III.11.4, III.11.5,	Both require similar sample/data documentation,	OW CM discusses required records throughout the manual, but not as a

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Control of Records</b>					
			III.12, Appendix A, IV.6, V.6, VI.6, IV.8.3, V.8.3, VI.8.3	but TNI provides more detail.	list of required records. TNI requires sample/data documents that allow the history of the sample to be readily understood and list what is to be included.
Retention of raw data, final reports, SOPs, PT	EL-V1M2-ISO-2008 Section 4.13.3.f	ISO/IEC 17025	III.11.8, III.11.13, III.15, Introduction	Yes	
Sampling, analytical and administrative records	EL-V1M2-ISO-2008 Section 4.13.3.f	ISO/IEC 17025	IV.8.4, V.8.4, VI.8.4, IV.8.3, V.8.3, VI.8.3, III.10.1, III.11.1, III.12	Similar, but TNI requires more detailed sample/data records.	TNI requires more records including all manual calculations and a log of signatures for personnel authorized to sign laboratory records or deliverables. OW CM does not discuss required records at the same level of detail.
Reconstruction of Data	EL-V1M2-ISO-2008 Section 4.13.3.f	ISO/IEC 17025	IV.8.5	Both require adequate information be available to allow the auditor to reconstruct the final results for compliance samples and PT samples.	
Internal audits	EL-V1M2-ISO-2008 Section 4.14	ISO/IEC 17025	Not Found	No	According to TNI, the laboratory shall periodically conduct internal audits of its activities.
Steps taken after audit finds errors or deficiency	EL-V1M2-ISO-2008 Sections 4.14.2, 4.14.3, 4.14.4	ISO/IEC 17025	Not Found	No	TNI requires that in the event of audit findings, the laboratory shall take timely corrective action, record the findings and corrective actions, and follow-up.

Subject	TNI Standard Reference	TNI Reference	OW/DWLCP Reference	Similarities	Differences
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		<b>conform to ISO?</b>			
<b>Management Reviews</b>					
Management Reviews	EL-V1M2-ISO-2008 Section 4.15, EL-V2M1-ISO-2008 Section 5.8	ISO/IEC 17025, ISO/IEC 17011	Not Found	No	OW CM does not discuss reviews that are conducted by quality assurance managers. TNI requires a management review of the QA/QC program in a laboratory.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Data Integrity</b>					
Data integrity and follow-up of audits	EL-V1M2-ISO-2008 Sections 4.2.8.1, 4.2.8.1, 4.16	ISO/IEC 17025	Not Found	No	TNI requires the laboratory to establish and maintain a documented data integrity system. Laboratories maintain SOPs that accurately reflect current laboratory activities, such as assessing data integrity.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Personnel</b>					
Personnel	EL-V1M2-ISO-2008 Section 5.2	ISO/IEC 17025	III.10, III.11.1, IV.1, V.1, VI.1, 4.1.1.1	Similar Programs	TNI does not specify positions (NOT including technical directors, Sect. 5.2.6.1) or type/amount of education, experience, and/or training needed, only "appropriate". Waiver of academic training is also not discussed in the TNI standards.
Contracted Personnel	EL-V1M2-ISO-2008 Section 5.2.3	ISO/IEC 17025	V.1.1	Vague	TNI-The laboratory shall use personnel who are employed by, or under contract to, the laboratory.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Personnel</b>					
					Where contracted and additional technical and key support personnel are used, the laboratory shall ensure that such personnel are supervised and competent and that they work in accordance with the laboratory's management system. OW CM only discusses contracted personnel for the supervisor/consultant position in the critical elements for microbiology chapter.
Personnel Job Descriptions	EL-V1M2-ISO-2008 Section 5.2.4	ISO/IEC 17025	III.11.1	Similar Requirements	
Personnel Records	EL-V1M2-ISO-2008 Section 5.2.5	ISO/IEC 17025	III.10.2, III.11.1, IV.1, V.1, VI.1, IV.8.4.6	Similar Requirements	
Up to Date Training	Individual technical modules Section 1.6.3		VI.1.5, IV.7.2.9	Similar requirements of ongoing demonstration of competence in the chemistry and radiochemistry sections.	OW CM only mentions ongoing demonstrations of proficiency for analysts and technicians in the critical elements for chemistry and radiochemistry chapter. TNI addresses ongoing demonstrations of proficiency in individual technical modules.
Activity Documentation	EL-V1M2-ISO-2008 Section 4.1.4	ISO/IEC 17025	III.11.7, IV.8, V.8, VI.8	Similar in regard to documenting the method and QC procedures used.	TNI-If the laboratory is part of an organization performing activities other than testing and/or calibration, the responsibilities of key personnel in the organization that have an involvement or influence on the testing and/or calibration activities of the laboratory shall be defined in order



Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Personnel</b>					
					to identify potential conflicts of interest.
Data Integrity Training	EL-V1M2-ISO-2008 Section 5.2.7	ISO/IEC 17025	Not Found	No	OW CM does not discuss data integrity training.
Laboratory Analyst and Technician	Individual technical modules Section 1.6		IV.1.2 and IV.1.3	No	OW CM specifies required education and experience for the laboratory analyst and technician, in addition to specialized training for the operation of analytical instrumentation. Additional requirements apply for the analysis of compliance samples. TNI-The analyst (s) shall demonstrate on-going capability by meeting the quality control requirements of the method, laboratory SOP, client specifications, and/or this Standard. TNI does not discuss educational or experience requirements for the laboratory analyst and technician.
Sampling Personnel	EL-V1M2-ISO-2008 Sections 4.13.2.1, 5.2, 5.2.5	ISO/IEC 17025	IV.1.4	Yes	OW CM requires that personnel who collect samples should be trained in the proper collection technique for all types of samples which they collect. Their technique should be reviewed by experienced sampling or laboratory personnel. TNI-The management shall authorize specific personnel to perform particular types of sampling, test and/or calibration, to issue test reports and calibration certificates, to give opinions and interpretations and to operate

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Personnel</b>					
					particular types of equipment. The laboratory shall maintain records of the relevant authorization (s), competence, educational and professional qualifications, training, skills and experience of all technical personnel, including contracted personnel.
Waiver of Academic Training Requirement	EL-V1M2-2008 Section 5.2.6.2		IV.1.5	Similar with some exceptions	Similar, but TNI does not have a "Waiver". OW CM-The certification officer may waive the need for specified academic training, on a case-by-case basis, for highly experienced analysts. TNI -A person who does not meet the technical manager education credential requirements, but meets the listed requisites can be a technical manager.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Accommodations and Environmental Conditions</b>					
Facilities and Control of Environmental Conditions	EL-V1M2-ISO-2008 Section 5.3	ISO/IEC 17025	IV.2, V.2, VI.2, III.11.4, III.11.11, III.11.12	Both require measures to prevent cross contamination.	TNI is not as specific as the OW CM in the standards for measures to prevent cross contamination. TNI does not describe the specific environment of the laboratory (i.e. cleanliness, instrument location, area for sample preparation, safety, and cleaning of glass wear).
Preventive maintenance procedures and schedules	EL-V1M2-ISO-2008 Sections 5.5.3, 5.5.5.g, 5.5.6, EL-V1M5-2008 Section 1.7.3.7.b.ii	ISO/IEC 17025	III.11.11	Yes	OW CM mentions that the preventative maintenance procedures and schedules should be addressed in the QA plan. TNI mentions that the laboratory shall have procedures for use and planned maintenance of measuring equipment to ensure proper functioning and in order to prevent contamination or deterioration.
Laboratory Safety	EL-V1M2-ISO-2008 Section 4.2.8.5.f.viii	ISO/IEC 17025	IV.4.4, V.4, VI.4.4	Similar	OW suggests that laboratory personnel apply general and customary safety practices as a part of good laboratory practices. Each laboratory is encouraged to have a safety plan as part of their SOP. Where safety practices are required in an approved method, they must be followed. For radiochemistry, OW CM requires certain protective equipment. TNI just states that safety shall be included or referenced in each test method.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Environmental Test and Calibration Methods and Method Validation</b>					
Environmental Test and Calibration Methods and Method Validation	EL-V1M2-ISO-2008 Sections 5.4, 5.5	ISO/IEC 17025	III.11.4, III.11.5, III.11.6, III.11.7, III.11.8, III.11.9, IV.3, V.3, VI.3, IV.5.1, VI.7.1	Yes	OW CM discusses use of EPA-approved methods, whereas TNI discusses client-specified and laboratory-approved methods. TNI discusses that deviation from environmental test and calibration methods should occur only if the deviation has been documented, technically justified, authorized, and accepted by the customer. OW CM does not.
SOPs with dates of last revision	EL-V1M2-ISO-2008 Sections 4.2.8.5.c, 5.4.1	ISO/IEC 17025	III.11.3	Both require annual review, signatures, and dated revisions.	TNI requires archive of SOPs so previous data can be paired with SOP requirements in force at the time of analysis.
Methods manual	EL-V1M2-ISO-2008 Section 5.9.3, EL-V1M2-ISO-2008 Section 5.4.1, EL-V1M7-2008 Section 1.7.1.1.d(tox)		III.11, IV.5.1	Both require manuals to be available, and have provisions for using non-standard methods.	TNI specifies the items to be included or referenced for each test method. The quality control protocols specified by the laboratory's SOP shall be followed (see Section 4.2.8.5 in this Standard). The laboratory shall ensure that the essential standards outlined in the individual Technical Modules or mandated methods or regulations (whichever are more stringent) are incorporated into their method manuals. When it is not apparent which is more stringent, the QC in the mandated method or regulations is to be followed. OW CM states that laboratories should

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Environmental Test and Calibration Methods and Method Validation</b>					
					prepare a written description of its QA activities.
Methods for clients	EL-V1M2-ISO-2008 Section 5.4.2	ISO/IEC 17025	III.11.2	No	OW CM has "Process used to identify clients' Data Quality Objectives" listed as a QAP inclusion, but provides no details on the topic. TNI discusses that the laboratory shall use methods that meet the needs of the customer.
Standards and Methods	EL-V1M2-ISO-2008 Sections 5.4.1, 5.4.2, 5.4.3, 5.4.4, 5.4.5	ISO/IEC 17025 except 5.4.4 and 5.4.5	IV.5, V.5, VI.5, IV.8.2, V.8.2, VI.8.2	Yes	OW CM does not discuss if laboratories must use the latest valid edition of a standard.
Method Confirmation and Demonstration	EL-V1M2-ISO-2008 Section 5.4, Individual technical modules Section 1.5	ISO/IEC 17025 except technical modules	III.11.9, V.5.6.1.4.1, V.5.6.1.4.5	Yes	OW CM does not discuss test method confirmation and validation (TNI 5.4.2, 5.4.5). OW CM specifies certain procedures that require initial and continuing demonstration of method capability and performance. TNI states that all methods should require those demonstrations and includes specific documentation and time requirements. TNI also addresses method validation in the individual technical modules.
Environmental Test and Calibration Methods	EL-V1M2-ISO-2008 Section 5.4	ISO/IEC 17025	Not Found	Similar	OW CM discusses use of EPA-approved methods, whereas TNI discusses client-specified and laboratory-approved methods.
Uncertainty	EL-V1M2-ISO-2008 Sections 4.13.2.1, 5.4.1, 5.4.6	ISO/IEC 17025 except Sect. 5.4.6	VI.7, 8.4.7, 8.5.9	No	OW CM only discusses uncertainty in the critical elements for radiochemistry chapter. TNI-The laboratory shall retain sufficient

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Environmental Test and Calibration Methods and Method Validation</b>					
					information to facilitate, if possible, identification of factors affecting the uncertainty. The laboratory shall use appropriate methods and procedures for all tests and/or calibrations within its scope, including where appropriate, an estimation of the measurement uncertainty.
Calculations and Data	EL-V1M2-ISO-2008 Sections 4.13.2.2, 5.4.7.1, 5.9.3.a.v, individual technical modules	ISO/IEC 17025 except Sect. 5.4.7.1	III.11.3, III.11.8, III.11.9, III.11.13, IV.8.2, IV.8.6, V.8.2, VI.7.6, VI.8.2, VI.8.6	Yes	
Laboratory Software Configuration or Modification Validation	EL-V1M2-ISO-2008 Sections 4.13.3.f.xv, 5.4.7.2, 5.5.5	ISO/IEC 17025 except Sect. 5.4.7.2	III.11.13, IV.8.6, VI.8.6	Yes	
Calibration Curve	EL-V1M2-ISO-2008 Sections 5.5.1, 5.9.3.a.iii, individual technical modules	ISO/IEC 17025	IV.7.2.3	Yes	
Calibration Check	EL-V1M2-ISO-2008 Sections 5.9.3.a.iii, 5.5.10, 5.6.3.3, individual technical modules, EL-V1M4-2008 Section 1.7.2 (chem), EL-V1M5-2008 Section 1.7.2 (microb), EL-V1M6-	ISO/IEC 17025 except Sect. 5.6.3.3 and technical modules	IV.7.2.4	Yes	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Environmental Test and Calibration Methods and Method Validation</b>					
	2008 Section 1.7.1.b(radio)				
Quantitation of Multicomponent Organic Analytes	EL-V1M4-2008 Sections 1.7.2.b, 1.7.3.2.3.b (chem)		IV.7.2.10	Both have provisions for quantitation of multicomponent organic analytes using a representative number of components.	OW CM (chemistry) indicates the analyst's professional judgment should be used and refers to EPA SW 846 for more information. A representative number (5-9) of peaks is suggested. TNI (chemistry) indicates that for continuing calibration and LCS for multi-component analytes, a representative chemical related substance or mixture can be used.
Low Level Quantitation	EL-V1M6-2008 (radiochem)		IV.7.2.12	No	OW CM-Minimum reporting limits (MRL) must be below the MCL. Laboratories should run a Laboratory Fortified Blank (LFB) at their MRL every analysis day and should not report contaminants at levels less than the level at which they routinely analyze their lowest standard. TNI-For low level samples the laboratory may analyze duplicate laboratory control samples or a replicate matrix spike to determine reproducibility within a preparation batch in place of a sample replicate.
Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences

Equipment					
Laboratory Equipment and Instrumentation	EL-V1M2-ISO-2008 Section 5.5, individual technical modules	ISO/IEC 17025 except technical modules	IV.3, V.3, VI.3	Both standards cover equipment and instrumentation	OW CM does not mention the use of equipment outside of a laboratories permanent control. TNI does not mention specific types of equipment and/or specific maintenance/calibration requirements.
Calibration	EL-V1M2-ISO-2008 Section 5.5	ISO/IEC 17025	IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7; III.11.6	Yes	Calibration requirements in the TNI standards are divided into two parts (analytical support equipment and instrument calibration). TNI-Instrument calibration requirements presented in the technical modules. Calibration requirements in the OW CM standards are found within the equipment, general laboratory practices, analytical methodology, sample, and quality control sections of each critical elements chapter (Section 3, 4, 5, 6, and 7 of Ch. IV, V, and VI).
Support Equipment	EL-V1M2-ISO-2008 Sections 5.5, 5.5.13.1	ISO/IEC 17025	III.11.9, III.11.11, III.11.12, IV.3, IV.7.1, V.3, V.8.5, VI.3, VI.7	Yes	OW CM specifies that preventive maintenance documents should be kept for five years. TNI does not mention specific types of equipment and/or specific maintenance/calibration requirements. OW CM specifies type of equipment, proper maintenance, and calibration for certain pieces of equipment needed in each critical element chapter.
Specific Device Accuracy	EL-V1M2-ISO-2008 Section 5.5.13.1.e	ISO/IEC 17025	Not Found	No	OW CM does not discuss mechanical volumetric dispensing devices or glass microliter syringes. TNI-Volumetric dispensing devices (except Class A glassware and Glass microliter syringes) must be



Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Equipment</b>					
					checked for accuracy on a quarterly basis.
Autoclave	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5	Both require autoclave operation records.	OW CM only mentions the use of an autoclave in the critical elements for microbiology chapter. OW CM does not state that pressure should be recorded for each run of the autoclave. TNI-Records of autoclave operations shall be maintained for every cycle. Records shall include: date, contents, maximum temperature reached, pressure, time in sterilization mode, total run time (may be recorded as time in and time out) and analyst's initials.
Instrument Calibration	EL-V1M2-ISO-2008 Section 5.5, individual technical modules	ISO/IEC 17025 except technical modules	III.11.3, III.11.9, IV.3, 7; V.3, 7; VI.3, 7, III.13.2	Similar but not identical	TNI standard does not specify detailed procedural steps for calibration, but establishes the essential elements for selection of the appropriate techniques. OW CM does not discuss verification of initial instrument calibrations by a standard obtained from a second manufacturer or lot (TNI 1.7.1.1.d for chem)(1.7.1.a.iv for radio). OW CM does not state if the lower calibration standard should be above the detection limit. TNI-the lowest cal point shall be at or below the LOQ. (1.7.1.1.f for chem)
Zero point and single point calibration standard	EL-V1M1-2008.1 Section 5.2.1.b, EL-V1M4-2008 Section	ISO/IEC 17025 except technical	Not Found	No	OW CM does not discuss instrument technology with validated techniques from

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Equipment</b>					
	1.7.1.1.h (chem)	modules			manufacturers or methods employing standardization with a zero point and a single point calibration standard.
Calibration Results	EL-V1M2-ISO-2008 Sections 5.5.2		III.11.9, III.11.12, IV.3, 7; V.3, 7; VI.3, 7	Yes	
Equipment use and maintenance	EL-V1M2-ISO-2008 Sections 5.5.6, 5.5.7		IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7; III.11.11, III.11.12	Yes	OW CM states that corrective actions are performed, described, and documented. OW CM does not discuss a “control of nonconforming work” procedure (TNI 5.5.7).
Equipment Records	EL-V1M2-ISO-2008 Sections 5.4.1, 5.5.3, 5.5.4, 5.5.5, 5.5.13.1, EL-V1M5-2008 Section 1.7.3.7.b.ii (microb)	ISO/IEC 17025 except technical modules	III.11.11, V.8.5, VI.7	OW CM's microbiology and radiochemistry sections require equipment records similar to TNI.	OW CM does not specify the exact items needed in records for equipment or labeled on equipment. TNI-The laboratory must have instructions on the use and operation of all relevant equipment, and on the handling and preparation of items for testing and/or calibration, or both.
Continuing instrument calibration verification	EL-V1M2-ISO-2008 Sections 5.9.3.a.iii, 5.5.10, 5.6.3.3, individual technical modules, EL-V1M4-2008 Section 1.7.2 (chem), EL-V1M5-2008 Section 1.7.2 (microb), V1M6 Section 1.7.1.b (radio)	ISO/IEC 17025 except Sect. 5.6.3.3 and technical modules	III.11.6, IV.7.2.4, VI.3.1.2, VI.3.1.5	No	In OW CM continuing instrument calibration verification is discussed in the chemistry and radiochemistry methods of the OW CM. TNI requires a standard from a second manufacturer or lot as continuing calibration verification for chemical testing and radiochemical testing.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Measurement Traceability</b>					
Measurement Traceability	EL-V1M2-ISO-2008 Section 5.6		IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7	Yes	
Testing Laboratories	EL-V1M2-ISO-2008 Sections 5.4.6, 5.9.3, EL-V1M7-2008 Sections 1.7.1.1(tox),1.7.1.6.q	ISO/IEC 17025 except Sect. 5.4.6 and technical modules	III.11.6, III.11.13, IV.3, 4, 5, 6, 7; V.3, 4, 5, 6, 7; VI.3, 4, 5, 6, 7	Yes	
Reference Standards and Materials	EL-V1M2-ISO-2008 Sections 4.2.8.4, 5.6.3, 5.6.4, 5.9.1, 5.9.3, individual technical modules	ISO/IEC 17025 except Sect. 5.6.3 and technical modules	IV.3, IV.7, V.3, V.7, VI.3, VI.7, III.11.3, III.11.13	Yes	OW CM specifies type of equipment, reference material, and calibration for certain pieces of equipment needed in each critical element chapter. TNI does not mention a specific type of reference standard or material and/or specific calibration requirements, however it states "Where possible, traceability shall be to national or international standards of measurement or to national or international standard reference materials" (TNI 5.6.4.1.b).
Records and Label	EL-V1M2-ISO-2008 Sections 5.6.4.2, 5.8.5, 5.8.6, individual technical modules	ISO/IEC 17025 except Sect. 5.6.4.2 and technical modules	III.11.6, 11.7, 11.9, 11.13	Yes	OW CM does not specify the exact items needed in records or labeled for all standards, reagents, reference materials and media.
Record keeping procedures	EL-V1M1-2008.1 Section 5.3, EL-V1M2-ISO-2008	ISO/IEC 17025 except Sect. 5.3	III.11.13, III.15, IV.8.2, V.8.2, VI.8.2,	Both have lists of inclusions for their individual record keeping procedures. Have	OW CM-records should be maintained for 6 years. A list of inclusions is provided. TNI-records

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Measurement Traceability</b>					
	Sections 4.13, 5.8.7, (records are mentioned throughout Vol1)		IV.8.1, V.8.1, VI.8.1	similar record retentions - OW CM 6 years and TNI 5 years.	should be maintained for 5 years. Provides a list of information necessary for reconstruction of data.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Sampling</b>					
Sampling	EL-V1M2-ISO-2008 Sections 5.4.1, 5.4.2, 5.5.2, 5.7, 5.8.4 Note 2, individual technical modules	ISO/IEC 17025 except technical modules	III.11.4, III.11.5, III.11.9, III.11.13	Yes	
Sample Collector	EL-V1M2-ISO-2008 Sections 4.13.2.1, 5.2.5	ISO/IEC 17025	IV.6.5	No	OW CM makes a general statement about sample collector training requirements. The records must include the identity of personnel responsible for the sampling, performance of each test and/or calibration and checking of results. TNI requires name of collector to be documented
Sample Compositing	Not Found		IV.6.7	No	OW CM–Compositing must be done in the laboratory, and only if the laboratory detection limit is adequate for the number of samples being composited (maximum of five).

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Handling of Samples</b>					
Samples	EL-V1M1-2008.1 Sections 5.0, 5.8, individual technical modules	ISO/IEC 17025 except Sect. 5.0 and technical modules	III.11.4, III.11.5, IV.6, V.6, VI.6	Yes	
Identification	EL-V1M2-ISO-2008 Sections 5.8.2, 5.8.5	ISO/IEC 17025	III.11.4, III.11.5, IV.6, V.6, VI.6, Appendix A	Yes	
Temperature	EL-V1M2-ISO-2008 Sections 5.3.2, 5.8.4, 5.8.9.a.i, individual technical modules	ISO/IEC 17025 except technical modules	IV.6.2, V.6.3	Yes	TNI mentions regulatory or method criteria for temperature, but gives a general guide for sample temperature if none is given. Also has more information in individual technical modules. OW CM is more specific than TNI on shipping and storage temperature.
Neutralization (stabilization)	EL-V1M2-ISO-2008 Sections 5.8.4, 5.8.9.a, EL-V1M5-2008 Sections 1.7.5.b (microb)	ISO/IEC 17025 except technical modules	V.3.15.4	OW CM and TNI specify that sodium thiosulfate should be added to each container to neutralize any residual chlorine.	OW CM and TNI standards specify that sodium thiosulfate should be added to each container to neutralize any residual chlorine, but OW CM does not list minimum concentrations that samples should be neutralized to. TNI instructs laboratory to neutralize at minimum 5 mg/l of chlorine for drinking water and 15 mg/l of chlorine for wastewater samples.
Sample Rejection	EL-V1M2-ISO-2008 Sections 5.8.3, 5.8.7.2.a	ISO/IEC 17025	IV.6.1	No	Only OW CM discusses rejection of samples in the critical elements for chemistry chapter.
Maximum Holding Times	Not Found EL-V1M2-ISO-2008	ISO/IEC 17025 except Sect.	IV.6.3	No	OW CM has a general statement indicating that holding times are to

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Handling of Samples</b>					
	Sections 4.13.3.f.v, 5.10.11.a, EL-V1M7-2008 Section 1.7.1.6.s(tox)	5.10.11.a and technical modules			be followed according to the specific method being used. TNI specifies hold time prescribed by the method and approved by the regulatory agency. TNI does present some hold times, such as: "The maximum holding time of effluents (elapsed time from sample collection to first use in a test) shall not exceed thirty-six (36) hours; samples may be used for renewal up to seventy-two (72) hours after first use except as prescribed by the method and approved by the regulatory agency having authority for program oversight" (EL-V1M7-2008 1.7.1.6.s).
Sample Collection and Transport	EL-V1M2-ISO-2008 Sections 5.4, 5.7, 5.8, individual technical modules	ISO/IEC 17025	IV.6.4	Both OW and TNI make general statements and indicate that sample collection is to be followed as specified in the method being used.	
Chain-of-Custody	EL-V1M2-ISO-2008 Sections 5.8.7.2.b.i, 5.8.7.4, 5.8.7.5, 5.8.8, EL-V1M3-2008 Section 1.7.8.1(asbestos)	ISO/IEC 17025 except technical modules	Appendix A, IV.8, V.8, VI.8	Both discuss chain-of-custody procedures.	TNI is not as specific in the chain-of-custody procedures for handling of samples and does not include examples of chain-of-custody forms in their standards.
Sample Acceptance	EL-V1M2-ISO-2008 Section 5.8.6	ISO/IEC 17025	IV.6.1 V.6, VI.6	OW CM states the laboratory should document its rejection criteria. TNI requires the laboratory to develop an overall sample acceptance	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Handling of Samples</b>					
				policy addressing the items listed in Section 5.8.6.	
Handling/Storage of Samples	EL-V1M2-ISO-2008 Section 5.8		III.11.4, III.11.5, IV.6, V.6, VI.6, Appendix A.D	Yes	
Storage Temperature	EL-V1M2-ISO-2008 Sections 5.8.4, 5.8.9		III.11.5, IV.6.2	Both discuss storing samples at appropriate temperatures.	Temperature requirement is only discussed in the critical elements for chemistry chapter of the OW CM standards. TNI discusses it more broadly, mentions using method specified temperatures for storage.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Assuring the Quality of Environmental Test and Calibration Results</b>					
Quality Control	EL-V1M2-ISO-2008 Sections 5.9.1, 5.9.2, 5.9.3	ISO/IEC 17025	III.11, IV.7, V.7, VI.7	Yes	

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Reporting the Results</b>					
Data reduction, validation, reporting and verification	EL-V1M2-ISO-2008 Section 5.10, Individual technical modules		III.11.8	No	OW CM only mentions that the procedure for data reduction, validation, and reporting should be included in the QA Plan.
Sample Report	EL-V1M2-ISO-2008 Sections 5.10.2, 5.10.3	ISO/IEC 17025	III.11.8, IV.6.6, VI.8.5, Appendix A	Both OW CM and TNI identify the minimal requirements of what should be included in sample reports.	OW CM discusses sample report format in the chemistry and radiochemistry methods. TNI encompasses all methods and requires more information for the Sample Report, such as consecutive page numbers, accreditation statements, management signatures etc.
Calibration Reporting Requirements	EL-V1M2-ISO-2008 Sections 5.10.1, 5.10.2, 5.10.4	ISO/IEC 17025 except Sect. 5.10.4	IV.8.4.5, VI.8.4.5	Yes	OW CM does not discuss calibration certificates or specific reporting requirements for calibration. However, OW CM does discuss calibration requirements and specifies type of equipment, reference material, and calibration for certain pieces of equipment needed in each critical element chapter. OW CM's critical elements of chemistry and radiochemistry chapters state that calibration and standards information must be reported in the analytical records. TNI specifies the actual items and circumstances that should be reported for calibration.
Subcontractor Reports	EL-V1M2-ISO-2008 Section 5.10.6		Not Found	No	OW CM does not discuss reporting requirements for work performed by contractors. TNI-When the test



Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Reporting the Results</b>					
					report contains results of tests performed by subcontractors, these results shall be clearly identified. The subcontractor shall report the results in writing or electronically. When a calibration has been subcontracted, the laboratory performing the work shall issue the calibration certificate to the contracting laboratory.
Electronic Transmission of Results	EL-V1M2-ISO-2008 Sections 5.4.7, 5.10.7		Not Found	No	OW CM does not discuss requirements in the case of transmission of environmental test or calibration results by telephone, telex, facsimile or other electronic or electromagnetic means. TNI-In the case of transmission of test or calibration results by telephone, telex, facsimile or other electronic or electromagnetic means, the standard requires conformance to the International Standards Organization requirement (see also 5.4.7).
Understandable Format	EL-V1M2-ISO-2008 Section 5.10.8		III.11.13, IV.8, V.8, VI.8, Appendix A	Yes	TNI-The format shall be designed to accommodate each type of test or calibration carried out and to minimize the possibility of misunderstanding or misuse.
Amendment to Test Reports and Calibration Certificates	EL-V1M2-ISO-2008 Section 5.10.9		Not Found	No	OW CM standards do not discuss requirements for amendments to test reports or calibration certificates.
Action in Response to	EL-V1M2-ISO-2008	ISO/IEC 17025	IV.9	No	TNI does not specify the

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Reporting the Results</b>					
Noncompliant Laboratory Results	Section 5.10.3.1.b				notification of water authority.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Demonstration of Capability</b>					
Initial Demonstration of Capability (DOC)	Individual technical module Section 1.6.2		IV.7.2.9, IV.8.4.6, V.5.6.1.4, III.11.9, IV.7.2.11	No	OW CM does require an Initial Demonstration of Capability be performed, but does not indicate when it is necessary. TNI-An initial DOC shall be conducted prior to using any test method, and at any time there is a change in instrument type, personnel or test method or any time that a method has not been performed by the laboratory or analyst in a twelve (12) month period.
Specifics of sample preparation and reporting	Individual technical module Sections 1.6.2.2, 1.6.3		IV.7.2.9, IV.8.4.6, V.5.6.1.4	No, program specific differences exist.	OW CM does not indicate that the samples used are from outside sources. For biological testing, TNI does not specifically state that the DOC test consists of ten reagent water samples spiked with enumerated sewage or equivalent at 1-2 PFU per sample for each coliphage type used or for each coliphage type analyzed, three field samples are spiked with 1-2 PFU, however it does give guidelines to prepare DOC samples. TNI

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Demonstration of Capability</b>					
					provides non-specific requirements for initial and on-going DOC in each test module. OW CM does not indicate the steps that need to be taken if the initial DOC fails. TNI does.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Essential Quality Control Requirements: Chemical Testing</b>					
Availability of QC Information	EL-V1M2-ISO-2008 Section 4.13.3.c	ISO/IEC 17025	IV.7.1.2	All quality control information should be readily available for inspection by auditors.	
Balances and Weights	EL-V1M2-ISO-2008 Section 5.5.13.1	ISO/IEC 17025	IV.7.1.3	Should be appropriate for the application to be used; balances should be calibrated at least annually. TNI requires that support equipment be calibrated or verified at least annually.	
Color Standards	Not Found		IV.7.1.4	No	TNI has no specific information about color standards.
Temperature Measuring Devices	EL-V1M2-ISO-2008 Section 5.5.13.1, EL-V1M5-2008 Section 1.7.3.7.b.i	ISO/IEC 17025	IV.7.1.5	Both require calibration or calibration verification.	OW CM has more detail and additional (more frequent calibration) requirements for digital thermometers, thermocouples, and infrared detection devices. TNI requires that support equipment be calibrated or verified at least annually.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Essential Quality Control Requirements: Chemical Testing</b>					
Traceability of Calibration	EL-V1M2-ISO-2008 Section 5.6.3	ISO/IEC 17025	IV.7.1.6	Both require calibrations of all measurement devices be traceable to national standards whenever applicable.	
Negative Control Purpose	EL-V1M4-2008 Section 1.7.3.1		IV.7.2.5	Both require a blank.	OW CM-blank should be analyzed as required by the method. TNI requires one method blank analysis at a minimum per preparation batch.
Laboratory Control Samples	EL-V1M4-2008 Section 1.7.3.2		IV.7.2.2	Both require a Laboratory Control Samples (LCS).	OW CM at least one LCS should be analyzed per quarter and LFBs as required by the method. TNI requires one LCS analysis at a minimum per preparation batch.
Matrix Spikes	EL-V1M4-2008 Section 1.7.3.3		IV.7.2.7	Both require a Matrix Spike (MS).	Both OW CM and TNI mention that the test method specifies the frequency of MS analysis, however OW CM does not mention Matrix Spike Duplicates (MSDs).
Detection Limits	EL-V1M4-2008 Section 1.5.2		IV.7.2.9, 7.2.11	Yes	OW CM is much more specific than TNI in stating the procedures and requirements for determining detection limits.
Quality Control Samples	EL-V1M4-2008 Section 1.7.3		IV.7.2.2	Yes	OW CM specifies frequency and procedures for detection limit studies of quality control samples.
Analytical Test	EL-V1M4-2008 Section 1.4 (Method Selection)		Not Found	No	OW CM does not discuss the involvement of the analytical method process or the matrix of interest. TNI-If there is not a regulatory requirement for the parameter/method combination, the

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Essential Quality Control Requirements: Chemical Testing</b>					
					parameter/method combination need not be validated under 1.5.1.b as a non-standard method if it can be analyzed by another similar standard method of the same matrix and technology.
Detection Documentation	EL-V1M4-2008 Section 1.5.2		IV.8	Yes	
Data Reduction Documentation	EL-V1M4-2008 Section 1.7.3.4		IV.7, 8	Yes	OW CM specifies the process and method of documentation. TNI specifies that the procedures for data reduction shall be documented.
Quality of Standards and Reagents	EL-V1M4-2008 Section 1.7.3.5		IV.4.1.1, 4.2.1, 4.3.1	Both specify the reagents must meet the method requirements.	TNI specifies that the quality of water sources shall be monitored, documented, and shall meet method specified requirements.
Verification of Titrants	EL-V1M4-2008 Section 1.7.3.5.c		Not Found	No	OW CM does not discuss the verification of concentrations of titrants, TNI does.
Selectivity	EL-V1M4-2008 Section 1.7.3.6		Not Found	No	TNI lists requirements for selectivity, OW CM does not.
Glassware preparation	Not Found		IV.4.2.2, IV.4.2.3	No	OW CM refers glassware cleaning requirements to those specified in the methods (summaries provided). TNI does not discuss glassware preparation in this technical module.
Analytical Methods - Analyses approved by the State	EL-V1M4-2008 Section 1.4		IV.5.2	No	TNI states "When a laboratory is required to analyze a parameter by a specified method due to a regulatory requirement, the parameter/method combination is recognized as a standard method".

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Essential Quality Control Requirements: Chemical Testing</b>					
Sample Collection, Handling, and Preservation	EL-V1M2-2008 Sections 5.7, 5.8, EL-V1M4-2008 Section 1.7.5		IV.6.7	Yes	OW CM was more specific in the requirements.
Quality Control	EL-V1M4-2008 Section 1.7.3		Entire Section of IV.7 (except 7.1.1 to 7.1.3, 7.2.5, 7.2.9, and 7.2.11)	Yes	OW CM was more specific in the requirements.
Action Response to Noncompliant Laboratory Results	Not Found		Entire Section of V.9	No	The listed OW CM sections on action regarding QC failure or noncompliant lab results are either not found or only briefly discussed in TNI.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Whole Effluent Testing Detailed Method Review</b>					
Toxicity Testing	EL-V1M7-2008		Not Found	No	OW CM does not discuss or contain a section regarding toxicity testing.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Microbiology Testing Detailed Method Review</b>					
Supervisor/consultant and analyst	EL-V1M2-2008 Section 5.2.6.1		V.1.1, V.1.2	TNI and OW CM have similar educational requirements.	TNI and OW CM have similar educational requirements, but TNI requires 16 college credit hours microbiology and biology while

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Microbiology Testing Detailed Method Review</b>					
					OW CM requires one course if the degree is in a field other than microbiology. OW CM also states that the supervisor needs to have two weeks of federal training of drinking water analysis or 80 hours on the job training and a laboratory may have consultants fulfill these duties if documentation showing that the consultant is acceptable to the state is presented during audits. OW CM requires that analysts have at least a high school degree; three months of microbiology testing experience in water, milk, or food media. TNI does not specify media or necessary bench criteria.
Waiver of academic training	EL-V1M2-2008 Section 5.2.6.2		V.1.3	Similar	TNI does not have an experience "Waiver" for academic training. OW CM-The certification officer may waive the need for specified academic training, on a case-by-case basis, for highly experienced analysts. TNI-A person who does not meet the technical manager education credential requirements, but meets the listed requisites can be a technical manager.
Personnel records	EL-V1M5-2008 Section 1.6 (DOC), V1M2-2008 Section 5.2		V.1.4	OW CM and TNI require similar records for personnel.	TNI makes this the responsibility of the management and includes an analyst signature record sheet.
Sterility Checks and Blanks	EL-V1M5-2008 Section 1.7.3.1		V.3, 4, 5, V.5.1.6.4	Yes	TNI does not list control organisms or frequency for testing

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Microbiology Testing Detailed Method Review</b>					
					commercially prepared medium. OW CM has specific requirements.
Filtration	EL-V1M5-2008 Sections 1.7.3.1.b.ii, 1.7.3.1.b.v		V.5.4.1.2, V.5.4.1.3	Both discuss rinsing the filtration funnels.	OW CM states that the funnel may be exposed to UV light at specified wavelength and time. OW CM states to test for growth and all data must be rejected if the control indicates contamination. TNI does not.
Container Sterility	EL-V1M5-2008 Section 1.7.3.1.b.iii		V.4.2	Both specify one check per lot (commercial) or batch (lab-prepared).	TNI does not specify the procedure for confirming container sterility such as amount and type of broth, incubation, etc.
Reagent grade water	EL-V1M5-2008 Section 1.7.3.5.c		V.4.3	Yes	OW CM provides quality requirements. Both have specific parameters with associated frequencies for testing.
Dilution Water Sterility	EL-V1M5-2008 Section 1.7.3.1.b.iv		V.4.4.3	Both specify one check per lot (commercial) or batch (lab-prepared).	TNI does not specify the procedure for confirming container sterility such as amount and type of broth, incubation, etc.
Dilution/rinse Water	Not Found		V.4.4 (except V.4.4.3 above), V.5.3.2.1.1, 4.3.2, 8.2	No	
Plate Counts	Not Found		V.5.4.2.8	No	OW CM does not discuss using only one microbiology analyst for duplicate plate counts in a laboratory.
Proficiency Test	EL-V1M2-2008 Section 5.0, EL-V1M5-2008 Sections		V.7.2, V.8.2	Yes	



Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Microbiology Testing Detailed Method Review</b>					
	1.5, 1.71				
Target Organisms	Not Found		V.4, V.5	No	
Test methods	EL-V1M5-2008 Section 1.4		V.3, 4, 5, 6, 7	Yes	
Media	EL-V1M5-2008 Sections 1.7.3.5.a, 1.7.3.5.b, 1.7.3.5.d		V.5.1.6, III.11, V	Yes	
Product Shelf Life	EL-V1M5-2008 Section 1.7.3.5		V.5.1.6.1, 5.1.6.2, 5.1.6.3	Yes	OW CM notes that caked or discolored dehydrated media should be discarded. TNI mentions using media during its shelf life.
Media Documentation	EL-V1M5-2008 Section 1.7.3.5.d		V.5.1.6.2, 5.1.6.3	Yes	For media prepared in the laboratory and media prepared commercially, OW CM does not state that the manufacturer, the amount of media prepared, and the expiration date must be documented. TNI does not state that sterilization time and temperature must be recorded.
Selectivity	EL-V1M5-2008 Section 1.7.3.6		Not Found	No	OW CM does not mention the preservation, preparation, and use of reference stocks.
Lab Facilities	EL-V1M5-2008 Section 1.7.3.7.a		V.2	Yes	TNI does not require laboratory to maintain effective separation between areas where activities are incompatible.
Temperature Measuring Devices	EL-V1M5-2008 Section 1.7.3.7.b.i		V.3.3	Yes	OW CM states the actual calibration, record, etc. requirements for temperature measuring devices. TNI only discusses if devices are "appropriate". TNI requires at least

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Microbiology Testing Detailed Method Review</b>					
					annual verification (see EL-V1M2-2008, Section 5.5.13.1) OW CM gives more detail.
Autoclaves	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.1, V.3.5.2	Yes	OW CM does not discuss initial evaluation of the autoclave. TNI does not discuss time requirements for the autoclave.
Autoclave Temperature	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.4	Yes	OW CM does not discuss the use of temperature sensitive tape.
Autoclave Records and Maintenance	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.3	Yes	OW CM does not discuss or require a pressure check and calibration of the temperature device during annual maintenance of the autoclave. TNI lists the autoclave operation records that must be maintained. TNI requires annual maintenance and includes a pressure check and calibration of the temperature device.
Autoclave Timing	EL-V1M5-2008 Section 1.7.3.7.b.ii		V.3.5.5	Yes	TNI requires the autoclave mechanic timing device to be checked quarterly against a stopwatch and documented.
Autoclave Parts	Not Found		V.3.5.6	No	TNI does not mention autoclave door seals and drain screens.
Volumetric Equipment	EL-V1M5-2008 Section 1.7.3.7.b.iii		V.3	Yes	OW CM specifies types of volumetric equipment and requirements for each. TNI requires volumetric equipment with movable parts be verified for accuracy quarterly, other volumetric equipment verified once per lot prior to first use.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Microbiology Testing Detailed Method Review</b>					
UV Instruments	EL-V1M5-2008 Section 1.7.3.7.b.iv		V.3.16.2	Yes	TNI requires UV instruments tested quarterly for effectiveness
UV Cleaning	Not Found		V.3.16.1	No	TNI does not discuss the frequency or process for cleaning the UV instruments.
UV Support Equipment	Not Found		V.3	No	OW CM specifies type of calibration requirements for support equipment. TNI specifies calibration according to the method specified requirements.
Incubator, Water Baths, and Ovens	EL-V1M5-2008 Section 1.7.3.7.b.v		V.3.4.1, 3.4.2, 3.6.1	Yes	OW CM specifies temperature and time in incubators, ovens, and water baths. TNI requires the temperature of incubators and water baths to be documented twice daily each day of use
Oven	EL-V1M5-2008 Section 1.7.3.7.b.v.2		V.3.6.3, 3.4.2, 3.6.3	Yes	TNI requires ovens to be checked for sterilization effectiveness monthly.
Glassware	EL-V1M5-2008 Section 1.7.3.7.b.vi		V.3.14.1	Yes	TNI does not discuss a description of plastic items.
Glassware Inhibitory Residue Test	EL-V1M5-2008 Section 1.7.3.7.b.vi.3		V.4.5.3	Yes	TNI requires annual testing and with every change in washing procedure
Glassware pH Reaction	EL-V1M5-2008 Section 1.7.3.7.b.vi.4		V.4.5.4	Yes	OW CM specifies the procedure for this test. TNI requires this test at least once daily each day of washing
Glassware Washing	EL-V1M5-2008 Section 1.7.3.7.b.vi		V.4.5.1	Yes	Similar, however TNI does not specify the use of distilled or deionized water for the final rinse.
Laboratory equipment and supplies	EL-V1M5-2008 Section 1.7.3.7.b		V.3.3, 3.5, 3.6, 3.13,	No	OW CM is more specific in discussing laboratory equipment in

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Microbiology Testing Detailed Method Review</b>					
			3.15, 3.17, V.3.1, 3.2, 3.7, 3.8, 3.9, 3.10, 3.11, 3.12, 3.14, 3.15, and 3.17		<p>general. Such as the temperature monitoring devices, OW CM discusses having a QC record book for specific temperature device information; whereas, TNI does not. TNI and OW CM standards on pipettes differ, and OW CM specifies that they have a precision and accuracy within 2.5%. TNI discusses volumetric equipment as a whole and not pipettes specifically. OW CM contains separate sections in the standard for volumetric glass and pipettes. TNI discusses UV Instruments in general OW CM contains separate standards for each type. TNI does not discuss size of containers sufficient for fermentation media, legible markings in graduated cylinders and pipettes (2.5% tolerance), and tube closings. The listed OW CM sections that were not previously discussed regarding laboratory equipment and supplies are either not found or only briefly discussed in the TNI standard. In most cases, OW CM was more specific in the maintenance and calibration requirements.</p>
General Laboratory Practices	Not Found		V.4.1, 4.4	No	Not found in TNI. In most cases, OW CM was more specific in the testing and notification requirements.

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<b>Microbiology Testing Detailed Method Review</b>					
Analytical Methodology	EL-V1M5-2008 Section 1.4		Entire Section of V.5 (except 5.1.6 to 5.1.6.4, 5.4.1.2, 5.4.1.3, 5.4.2.8, and 5.6.1.4)	No	OW CM was more specific in the methods requirements. TNI does not list specific methods as a requirement, unless already prescribed to meet federal or local regulations.
Sample Collection, Handling, and Preservation	EL-V1M5-2008 Section 1.7.5		Entire Section of V.6 (except 6.5 and 6.6)	No	OW CM was more specific in the sampling/handling/preservation requirements.
Action Response to Laboratory Results	Not Found		Entire Section of V.9	No	Not found in TNI. In most cases, OW CM was more specific in the testing and notification requirements.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Radiochemical Analysis Detailed Method Review</b>					
Laboratory Supervisor/Technical Manager	EL-V1M2-2008 Section 5.2.6.1		VI.1.1	Similar requirements for Laboratory Supervisor/Technical Manager.	TNI standard 5.2.6.1 requires a BS with 24 credit hours in chemistry and 2 years experience in analysis or only one year experience with a masters/doctoral. OW CM does not have credit hour requirements and requires only one year of experience. TNI does list several exceptions to this depending on the particular lab environment.
Laboratory Analyst	Not Found		VI.1.2	No	OW CM gives specific education, training and experience

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Radiochemical Analysis Detailed Method Review</b>					
					requirements for an analyst. TNI does not give specific requirements for an analyst, but does for a technical director in 5.2.6.1
Technician	Not Found		VI.1.3	No	See above comment for laboratory analyst.
Sampling Personnel	Not Found		VI.1.4	No	See above comment for laboratory analyst and technician.
Initial and Ongoing Demonstration of Proficiency for Analysts and Technicians	EL-V1M6-2008 Section 1.6.2		VI.1.5	Ongoing DOCs can be performed via QC or the method by which the initial DOC was performed.	The OW CM describes specific means by which an initial DOC must be performed. TNI gives ways to complete an initial DOC if not specified by the method or regulation.
Method Blanks	EL-V1M6-2008 Section 1.7.3.1		VI.1.5	Both required a background check daily.	OW CM mentions instrument and reagent blanks. OW CM requires an instrument blank to check background analyzed on each day. Instrument must be placed out of service if blank is out of control. TNI requires at a minimum one method blank per batch (of no more than twenty samples). Data with a failing method blank should be reprocessed for analysis or flagged with the appropriate data-qualifying codes.
Data Produced by Analysts and Technicians in Training	Not Found		VI.1.6	No	OW CM states that this data must be reviewed by a fully qualified analyst or the lab supervisor. TNI requires final data review and release by a Technical Director.
Waiver of Academic	EL-V1M2-2008		VI.1.7	Yes	OW CM offers an academic waiver

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Radiochemical Analysis Detailed Method Review</b>					
Training	Section 5.2.6.2.c				to highly-experienced analysts. TNI does not have a "waiver", but does require twelve months prior laboratory management experience at the time of application for certification if academic requirements are not met.
Positive, negative, and other controls	EL-V1M6-2008 Section 1.7.3		VI.3.1.5, VI.4.2, VI.7.3	Yes	See method blank discussion above concerning negative controls. Positive controls have specific criteria in the OW CM, while NELAC details these as "laboratory control samples" that are spiked with an analyte of interest and analyzed to meet specific performance criteria. OS CW details matrix spike requirements for field collection, which TNI omits. TNI includes criteria for surrogate spikes, which the OS CW omits.
Radiation Counting Instruments	EL-V1M6-2008 Section 1.7.1		VI.3.1	Detection limits are similar.	TNI does not provide detailed information on the overall process of calibration of each type of radioactivity counter, while the OW CM does. OW CM does not address background levels measurement. TNI goes into specific detail about this.
Liquid Scintillation Counting (LSC) system Background Check	EL-V1M6-2008 Sections 1.7.1.a, 1.7.1.b, 1.7.1.c		VI.3.1.1	Both agree that background checks should be performed daily.	TNI does not describe the check process in detail.
Gas~flow	EL-V1M6-2008		VI.3.1.2	Both agree that background	

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<b>Radiochemical Analysis Detailed Method Review</b>					
Proportional Counting System Background Check	Section 1.7.1.c			checks should be performed daily.	
Alpha Scintillation Counting System Background Check	Not Found		VI.3.1.3	No	TNI does not describe the background check process in detail. OW CM mandates a background check performed each time a set of compliance monitoring samples is analyzed, or weekly.
Scintillation Cell System Background Check	EL-V1M6-2008 Section 1.7.1.c		VI.3.1.4	No	TNI states that background checks must be performed daily. OW CM states they must be performed each time a set of compliance monitoring samples is analyzed. OW CM provides more information about this technology.
Gamma Spectrometer Systems Background Check	EL-V1M6-2008 Section 1.7.1.c		VI.3.1.5	Both agree that background checks should be performed monthly.	
Alpha Spectrometer Systems Background Check	EL-V1M6-2008 Section 1.7.1.c		VI.3.1.6	Both agree that background checks should be performed monthly.	
Other Radiation Instrumentation Background Checks	Not Found		VI.3.1.7	No	OW CM states that the calibration and background checks should be consistent with the method being used and the manufacturer's recommendation. NELAC wrote the section on Radiation Counting Instruments to be all-inclusive, thus this is not applicable to that standard.
Chemicals/reagents	EL-V1M6-2008 Section 1.7.2.5		VI.4.1	Yes	OW CM does not discuss standards for purchasing from outside US



Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Radiochemical Analysis Detailed Method Review</b>					
					commercial suppliers.
Reagent Water	EL-V1M6-2008 Section 1.7.2.5		VI.4.2	No	TNI requires that reagent water meet the standards of the method in use. OW CM has more specific parameters required for reagent water.
Glassware/Plasticware	EL-V1M6-2008 Section 1.7.2.7.b		VI.4.3	Both state that glassware should be washed in accordance with the method in use.	TNI states if there is no specification in the method, then the washing procedure should be documented. OW CM includes a specific procedure to wash glassware when the correct procedure is not documented in the method.
Safety	Not Found		VI.4.4	Both standards state that proper safety measures should be addressed in the laboratory standard operating procedures.	The TNI standard does not address safety specifically for radiochemical analysis.
Analytical Methods: Standard Operating Procedures (VI.5.1)	EL-V1M2-2008 Sections 3.0, 4.2.8.5		VI.5	Yes	The OW CM states that the methods cited in 40 CFR parts 141.25 (a) and (b) must be used. OW CM also includes a table listing those methods. TNI does mention requirements for SOPs in general.
Sample Collection, Handling, and Preservation: Compositing Samples (VI.6)	Not Found		VI.6.1	No	TNI does not include composite samples.
Matrix spikes and duplicates (replicates),	EL-V1M6-2008 Sections 1.7.2.3.a,		VI.7.7.1, VI.7.7.2,	Yes	See above discussion about positive controls for matrix spike

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Radiochemical Analysis Detailed Method Review</b>					
low level samples	1.7.2.3.b		VI.7.2.12		comparison. Duplicates in the OW CM are described as replicate analysis of the same sample, however TNI defines this as a replicate piece of sample carried through the entire sample process. The OW CM also describes the process in more detail. Concerning low level samples, the OW CM states that target levels below the MRL should not be reported. TNI asks that an instrument duplicate be run to determine data reproducibility to assess the accuracy of low level samples.
Laboratory control samples	EL-V1M6-2008 Sections 1.6.1, 1.6.2.2, 1.6.3, 1.7.2.2		VI.7.7.3	Yes	TNI does not state that the batch has to be thrown away if samples are recounted and LCS (if LCS assessments have already exceeded the limits) assessment is still unsatisfactory. TNI requires at a minimum one per batch. TNI does not describe the process in detail.
Activity level and source of matrix spikes and LCS	EL-V1M6-2008 Sections 1.7.2.2.g, 1.7.2.3.a.vii		VI.7.72	Yes	The TNI states that the matrix spikes should be spiked at a level five times the minimum detectable activity (MDA) and an LCS should be spiked at ten times the MDA. The OM CW requires the matrix spikes to be spiked at ten times the anticipated sample activity level and handles the LCS samples in the same way. The TNI also states that a matrix spike can be used in place

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Radiochemical Analysis Detailed Method Review</b>					
					of an LCS.
LCS or matrix spike for more than one isotope	EL-V1M6-2008 Sections 1.7.2.2.g, 1.7.2.3.a.vii		Not Found	No	The OM CW does not address this issue.
Initial demonstration of capability	EL-V1M6-2008 Section 1.6.2		VI.1.5	Both standards require an IDC to be performed for each instrument and at times when a change of personnel or method occurs.	
PT	EL-V1M2-2008 Section 5.0, EL-V1M5-2008 Sections 1.5, 1.71		VI.7.4	No	TNI does not discuss in detail mixed alpha and mixed beta/gamma PT studies.
Instrument calibration (general)	EL-V1M6-2008 Section 1.7.1.1		III.11.6	No	TNI goes into far more detail about instrument calibration, while the OW CM standard only describes the basic components of instrument calibration requirements.
Alpha and gamma spectroscopy calibration	EL-V1M6-2008 Sections 1.7.1.b.i, 1.7.1.b.ii		VI.3.1.5, VI.3.1.6	Yes	TNI does not describe the calibration process in detail for any particular analysis.
Gas~proportional and liquid scintillation calibration	EL-V1M6-2008 Section 1.7.1.b.iii		VI.3.1.2, VI.3.1.1	Yes	TNI does not describe the calibration process in detail for any particular analysis.
Scintillation counters calibration	EL-V1M6-2008 Section 1.7.1.b.iv		VI.3.1.3	Yes	TNI does not describe the calibration process in detail for any particular analysis.
Background measurements	EL-V1M6-2008 Section 1.7.1.c		VI.3.1, VI.3.1.5, VI.3.1.6, VI.3.1.2, VI.3.1.1, VI.3.1.3,	Neither standard provides specific procedures to determine background measurements for radiation counting instruments.	TNI does not state background measurements for every type of radiation counting instrument.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Radiochemical Analysis Detailed Method Review</b>					
			VI.7.8		
Detection limit	EL-V1M6-2008 Section 1.5.2.1		VI.3.1, VI.3.1.5, VI.3.1.6, VI.3.1.2, VI.3.1.1, VI.3.1.3	Yes	The OW CM does not list specific procedures for detection limit determination or requirements other than the limits mentioned in the CFR. TNI describes very specific requirements for detection limits.
Results with uncertainties reported	EL-V1M6-2008 Section 1.5.4		VI.8.4	No	TNI states that uncertain results should be flagged appropriately. There is no specific mention of this in the OW CM.
QC program maintain and establish provisions for radionuclide standards	EL-V1M6-2008 Section 1.6.2.2		Not Found	No	The OW CM does not mention radionuclides in relation to QC programs. TNI mentions radionuclides in LCS samples where gamma-ray spectrometry is used.
Issues of purchase and labels of standards and reagents	EL-V1M6-2008 Section 1.7.2.5		VI.4.1	Yes	See above "Reagent" discussion for major differences. In addition, the OW CM does not mention reagent labeling specifically.
Cross~contamination and background checks	EL-V1M6-2008 Section 1.7.2.7.c		VI.3.1.2, VI.3.1.5, VI.3.1.6	Yes	OW CM does not mention ways to prevent cross~contamination. OW CM does not make clear that background checks for gamma spectrometry are conducted each day of use.
Laboratory facilities (general for radiochemical)	EL-V1M6-2008 Section 1.7.3.7		VI.2, VI.4.4, VI.4.3	No	The OW CM is more specific in its expectations of cleanliness, instrument placement, etc. TNI only requires the laboratory facilities to be in such a state as not to affect testing results.

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<b>Radiochemical Analysis Detailed Method Review</b>					
Aspects of records and data reporting	EL-V1M6-2008 Section 4.13		VI.8.2, VI.8.3, and parts of VI.8.4, VI.8.5, VI.8.6	No	TNI specifies a five-year hold time on all data, while the OW CM requires ten years. The OW CM also specifies on what medium data may be backed up.
Instrument and Method Performance Charts/Records	EL-V1M6-2008 Section 1.7.1.b		VI.7.8	Both discuss control charting.	TNI specifies control charting methods for each type of radiation counting instrument.
Action Response to Noncompliant Laboratory Results	Not Found		VI.9	No	Action taken in response to non-compliant results is discussed only briefly in the TNI standard, however, the OW CM states that the appropriate authorities must be notified when non-compliant results are reported.

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<b>Air Testing Detailed Method Review</b>					
Air Testing			Not Found	No	OW CM only applies to laboratories dealing with water.

Subject	TNI Standard Reference	TNI Reference conform to ISO?	OW/DWLCP Reference	Similarities	Differences
<b>Asbestos Testing</b>					
Asbestos Testing			Not Found	No	OW CM only applies to laboratories dealing with water.