



Safety Codes Council

COUNCIL ORDER NO. 2021-08

BEFORE THE ADMINISTRATIVE TRIBUNAL OF THE PLUMBING SUB-COUNCIL

(the “Tribunal”)

ON MARCH 14, 2021

IN THE MATTER OF the *Safety Codes Act*, Revised Statutes of Alberta 2000, Chapter S-1 (the “Act”);

AND IN THE MATTER OF the permit refusal in the private sewage disposal systems discipline against [REDACTED] (the “Appellant”) by [REDACTED] (the “Respondent”) for [REDACTED] (the “subject property”) on November 30, 2021 (referred to as the “Refusal”);

UPON REVIEWING AND CONSIDERING the evidence named in **The Record**, including written submissions of the Appellant and Respondent (the “parties”); and **UPON HEARING** the testimony of the parties at the virtual hearing;

IT IS HEREBY ORDERED THAT the Refusal is CONFIRMED.

Appearances, Preliminary, Evidentiary, or Procedural Matters:

1. The hearing for this matter was conducted by virtual means.
2. At the commencement of the hearing, the Coordinator of Appeals confirmed the subject of the appeal as the Refusal, and confirmed the names of those in attendance:
 - a) Appearing for the Appellant, the Tribunal heard from [REDACTED].
 - b) Appearing for the Respondent, the Tribunal heard from [REDACTED].
 - c) Facilitating the hearing on behalf of the Safety Codes Council: [REDACTED].
 - d) Attending as Technical Advisor for the hearing: [REDACTED].
 - e) Attending as observers for the hearing: [REDACTED].

3. The Coordinator of Appeals then introduced the Chair of the Tribunal (the “Chair”), [REDACTED] and turned the hearing over to him.
4. The Chair called the hearing to Order and introduced the other Tribunal members and their nominating organizations: [REDACTED].
5. Both parties confirmed there were no objections to any members of the Tribunal, and that the Safety Codes Council in general and the Tribunal in particular had jurisdiction to hear and decide the appeal. The Tribunal also confirmed they had jurisdiction to hear and decide this appeal.
6. The Chair then explained the process of the hearing, and advised of the list of the written material before the Tribunal, consisting of the documents listed below in **The Record** (see paragraph 8). The Appellant and Respondent confirmed that there were no objections to any of the material submitted to the Tribunal.
7. The Respondent submitted one piece of new evidence. The Appellant was provided an opportunity to review the new evidence and did not object to the submission of it to the Tribunal. The Tribunal accepted the additional evidence, it was marked as “**Exhibit 2 Respondent**” and was distributed to the parties, the Tribunal, the Co-Facilitators, and the Technical Advisor, with one copy retained for **The Record**.

The Record:

8. The Tribunal considered, or had available for reference, the following documentation:

<u>Item</u>	<u>Description</u>	<u>Date</u>
i.	Notice of Appeal	December 10, 2021
ii.	Council’s Acknowledgment Letter	December 10, 2021
iii.	Council’s Notification of Hearing Letter	February 15, 2021
iv.	EXHIBIT 1 APPELLANT – Appellant’s Appeal Brief	-
v.	EXHIBIT 1 RESPONDENT – Respondent’s Appeal Brief	-
vi.	EXHIBIT 2 RESPONDENT – Soil Log for Test Pit 1	-

Issue:

9. This appeal concerns the interpretation of the *Alberta Private Sewage Systems – Standard of Practice, Third Edition 2015* (the “SOP”) with respect to determining the loading rates for a soil-based treatment system.

Positions of the Parties:

Appellant

From the Appellant's submissions and testimony, the Appellant's position is summarized as follows:

10. The Tribunal should direct the issuance of the permit because neither of the loading rates should be calculated based on the most limiting layer, as this is not a prescriptive requirement of the SOP nor is it backed by science. The permit application met the intent of the SOP and the SCO erred in the interpretation of the Code.

Respondent

From the Respondent's submissions and testimony, the Respondent's position is summarized as follows:

11. The Refusal should be confirmed because the system design for the subject property needs to reflect the loadings rates using the most limiting layer as shown in the soil logs and laboratory results, as required by the SOP.

Summary of the Evidence Provided On Behalf of the Appellant:

Evidence provided on behalf of [REDACTED]

12. The SOP does not specifically set out that the most limiting layer must be used for both loading rate calculations.
13. A conclusion has been drawn by industry in Alberta that because 7.1.1.2.(3(c)(ii) requires a soil sample from the most limiting condition affecting the design; the most limiting layer applies to the 8.1.1.10. table and is used to calculate the loading rates. This is contrary to the teachings of Dr. Jerry Tyler, whose table is used in the SOP at 8.1.1.10. Given that the SOP does not give instructions on how the table should be used we should learn from Dr. Tyler, the author of the table, who does not use the most limiting layer for the determination of either loading rate.
14. Parts 8.1.1.2., 8.1.1.3., and 8.1.1.10. of the SOP require that a septic system design is to meet the capabilities of the soil; therefore, the importance is placed on the soil profile and not just the most limiting layer.
15. Loading rates are not about septic treatment but rather preventing the saturation of treatment zones.
16. The SOP does refer to two separate and distinct loadings rates: the infiltration loading rate and the hydraulic linear loading rate and they should be treated that way. Two different water movements need to be considered in different horizons and take into account the well-established principle that water will follow the path of least resistance.
17. Dr. Tyler teaches to:
 - 1) use the texture, structure and consistence of the soil adjacent to the infiltration zone for the infiltration loading rate; and
 - 2) use the texture, structure and consistence of the soil above the most limiting layer and below the infiltration zone for the linear loading rate (Page 24 of The Record).

18. In the permit application, the infiltration loading rate of 0.3 gal/day/ft² was based on the infiltration zone (loam, blocky 1) and the linear loading rate of 3 gal/day/ft was based on the horizon most restrictive to water flow (clay loam, blocky 2) with a 4% slope (Page 5 of The Record). The design is for a five-bedroom home with four bathrooms.
19. For the infiltration loading rate, this is the rate wastewater enters the soil; therefore, it is not possible to use the most limiting layer as water will not enter there. The soils in the infiltration zone should be used to size the field. This also ensures the right amount of clogging layer or biomat to prevent a system failure, in that it acts to regulate how fast the effluent flows into adjacent soils. Accordingly, the right volume is important for short-term saturated flow over the clogging layer.
20. For the hydraulic linear loading rate this is the rate the soil can transmit the treated effluent away from the infiltration surface. This requires ensuring no excessive mounding and horizontal movement over the limiting layer, as water cannot move through the limiting layer. Therefore, the identification of the limiting layer is important only to determine the layer above it to calculate the linear loading rate and ensure the horizontal movement through a more permeable shallow horizon.
21. The loading rates were specifically designed by Dr. Tyler for sufficient flow and the build up of the clogging layer. Alberta's arbitrary reduction of sand loading rates offers an example and displays how the system was made worse by altering the loading rate; there is no clogging which leads to saturated flow and potential for untreated effluent to get into the ground.
22. No one, including the SCO and those from Municipal Affairs and the Alberta Onsite Wastewater Management Association (AOWMA), have been able to explain why the most limiting layer should be used for determining the two loading rates. The use of the most limiting layer for both loading rates is not a correct interpretation of the SOP and is mistaught by the AOWMA.
23. This issue has been previously raised with Municipal Affairs and the Private Sewage Disposal Systems (PSDS) Working Group and documents provided, but no response has been received to date.
24. The conservative approach that has been adopted in Alberta requires a larger system and comes at a higher cost for Albertans requiring septic systems. Other jurisdictions across North America follow Dr. Tyler methodology and this is accepted by other colleagues who are experts on the matter.
25. For the subject property, the use of more separated trenches was done to add a margin of safety for the client; therefore, the location of the laterals did change from what was submitted in the permit application but this had no impact on the loading rates. The Appellant is willing to resubmit the design to reflect the location change if required.
26. On the issue of not identifying the most limiting layer, the permit application was for the design of a soil-based septic treatment system that will receive primary treated effluent so in accordance with 8.1.1.4. a vertical separation of 60 inches is required. Based on the design, the trench bottom is 24 inches below the surface so the design depth would be 84 inches, not 93 inches as stated by the Respondent. Therefore, the required vertical separation exists and the soil sample (Page 78 of The Record) was taken from the most limiting layer affecting the design per the requirement in 7.1.1.2.(3)(c)(ii).
27. With respect to 7.1.1.2.(3)(c)(ii), in the 2009 version of the Standard of Practice the article read as 'restricting' versus 'limiting' and the intent of the article was to restrict the downward movement of

the water. Using texture has less to do with the downward movement than the structure of the soil, which a lab cannot identify. The texture of the layer does not help ensure mounding does not occur in the system. The requirement is to sample the most limiting condition; it is not explicit that it should be used in the system design.

28. On the issue of the hard consistency noted in the soil logs, this is an error and can be corrected. The consistency of those soils are not hard. This was not previously pointed out by the SCO as an issue or reason for the Refusal.
29. It is not that Dr. Tyler's teachings supersede the SOP but rather that there is not a prescriptive requirement for using the most limiting layer and so the SCO erred in their interpretation of the SOP. The use of the most limiting layer is unscientific. The responsibility is on the safety codes officer to apply science and not just rely on local practice.
30. The design in the permit application meets the intent of the SOP and the permit should have been issued.
31. With this Refusal, the owner of the subject property is facing a significant disadvantage.

Summary of the Evidence Provided On Behalf of the Respondent:

Evidence provided on behalf of [REDACTED]

32. On November 17, 2021 a permit application was submitted for the installation of a septic system design for a five-bedroom home by the Appellant (Page 57-91 of The Record).
33. There was a meeting, on November 22, 2021, between the parties and representatives from Municipal Affairs, which was previously scheduled with respect to a different permit application but similar issue. The direction out of this meeting from Municipal Affairs was that in applying the SOP the requirement is to use the most limiting layer to determine the loading rates.
34. The SCO also conducted a site inspection on November 22, 2021 and it was observed that the location of the laterals were in a different direction than what was submitted in the design (Page 93 and 96 of The Record).
35. The SCO requested that the Appellant submit a revised design using the loading rates from the most limiting layer to comply with the SOP and interpretation provided by Municipal Affairs (Page 93 of The Record) and to date this has not been received.
36. The Appellant requested that a written refusal be issued to appeal the decision of the SCO (Page 94 of The Record).
37. On November 30, 2021, the Refusal was issued in accordance with Section 26 of the Permit Regulation, as there was insufficient information submitted related to the loading rates and soils.
38. In the permit application, the most limiting layer was not used to determine the loading rates and a soil sample of the most limiting condition in the soil profile was not provided (Pages 108-109 of The Record).
39. The most limiting layer is at horizon A2. This is clay loam, blocky 2 (Page 75 of The Record). Using table A.1.E.1. in the SOP, this has an infiltration loading rate of 0.27 gal/day/ft². The design summary

indicates a loading rate 0.3 gal/day/ft² (Page 48 of The Record). The source info noting clay loam, blocky 1 in the limiting layer (Page 72 of The Record) is not in accordance with the soil log (Page 75 of The Record). Secondly, a soil sample for this horizon was not produced in accordance with 7.1.1.2.(3)(c)(ii).

40. The submitted soil sample was for 24 and 48 inches for Test Pit 1 (Page 77 of The Record), which was loam and silt loam. Loam has a loading rate 0.3 gal/day/ft² and silt loam would have a loading rate of 0.45 gal/day/ft².
41. However, upon further review of the permit application after the Refusal, it was identified on the soil logs (Pages 75-76 of The Record) that at horizon B2 (43-62" Test Pit 1 and 32-37" Test Pit 2) a dry and hard consistency was noted. Per the SOP, this becomes the restrictive layer by 8.1.1.10.(3); therefore, it is not suitable.
42. The submitted soil sample (Pages 77-78 of the Record) is not in accordance with 7.1.1.2.(3)(c)(ii) given the information in the soil logs (Page 75-76 of The Record); a lab analysis of the silty clay layer in Test Pit 2 should have been provided as it would affect the design with the vertical separation requirement.
43. The table at 8.1.1.10. in the SOP was adapted from Dr. Tyler, as stated in Note 1. Furthermore, there is no grounds that the information from Dr. Tyler supersedes what is in the code in force in Alberta, which is the SOP.
44. This is not the appropriate forum for this matter. Municipal Affairs supported the interpretation of the SCO.

Evidence provided on behalf of [REDACTED]

45. Based on the information provided, [REDACTED] would agree with the findings of the SCO that a permit should not be issued until redesign is submitted due to the hard consistency identified in the soil logs.
46. The SOP is the governing document for Alberta and soil based septic treatment systems. It is the code used by designers, installers, and safety codes officers.
47. Looking at the values provided in tables 8.1.1.10. and A.1.E.1., the SCO was correct in declining the permit and asking for a redesign.
48. The requirement to use the most limiting layer is drawn from Article 7.1.1.2.(3)(c)(ii), as it is the soil sample to be collected and analyzed, it should also be used for the system design. This was the intent identified through attendance at the PSDS Working Group and development of the SOP.

Technical Advisor – Questions & Answers:

49. [REDACTED] was the Private Sewage Technical Advisor with Alberta Municipal Affairs present for the hearing. The role of the Technical Advisor is to clarify questions of the Tribunal regarding the interpretation of the relevant codes and any related code issues. The Tribunal deliberated on the questions for the Technical Advisor in camera. All parties including the Technical Advisor and observers reconvened in the virtual hearing room and the Chair posed the Tribunal's questions to the

Technical Advisor and received the following responses:

50. Q: *Is there a prescriptive requirement for using the most limiting layer for both loading rate calculations in the SOP?*

A: Yes there is, although it is not cut and dry. There are two code clauses that talk about hydraulic loading and so the requirement is established by tying those clauses together:

- 1) 7.1.1.2.(3)(c)(ii) - a soil sample of the most limiting condition in the soil profile affecting the design shall be collected and analyzed at a laboratory using a recognized particle size analysis method to determine the texture of the sample.
- 2) 8.1.1.3.(1) - The effluent hydraulic loading rate on the soil infiltration surface shall be based on the soil texture and structure as set out in Table 8.1.1.10. when the required vertical separation distance below the infiltrative surface is available.

The intent statement sets out that: The soil texture classification and soil structure are key indicators of the hydraulic conductivity of the soil or the rate at which the soil will accept and transmit water. The soil texture classification of samples taken from the most limiting design layer in the soil profile shall be determined by lab tests. Other field criteria must also be given consideration when sizing a system, such as type of clay, seasonal high water table and water quality; for example, the water's sodium adsorption ratio.

51. Q: *What sections of the SOP need to be taken into consideration for linear loading rates of a septic disposal system?*

A: 8.1.1.10. ties in the effluent hydraulic loading rates and effluent hydraulic linear loading rates suitable for the soil profile identified at the site, as characterized by the texture and structure of the soil, shall be determined by using Table 8.1.1.10.

8.1.1.2. Infiltration Area – In determining the soil infiltration surface area required for a soil-based effluent treatment system, the following shall be considered in the design:

- a) hydraulic loading capabilities of the soil profile,
- b) linear loading rate limitations of the soil profile,
- c) organic loading on the soil infiltration surface resulting from the effluent strength,
- d) treatment capability of the soil profile,
- e) depth of suitable soil required to achieve treatment objectives, and
- f) achievement of treatment objectives at a depth that does not exceed 2.4 m (8 ft.), or a lesser depth as required by the site conditions and intended treatment boundary limits.

52. Q: *What is the significance of the soil sample for a septic disposal system per the SOP? Clarification – for example where the consistency is hard, why is that significant?*

A: Where the consistency is hard this is significant for the design, 8.1.1.10.(3) talks about the restrictive layer and in 8.1.1.10.(1) it discusses using this to determine the loading rate. That is why the soil sample is so important. There is also 8.1.1.2. Infiltration Area.

Findings of Fact:

The Tribunal makes the following findings:

53. A permit in the private sewage discipline was applied for by the Appellant for the subject property for a soil-based treatment system (Page 57 of The Record).
54. The Refusal was issued because the Appellant used the infiltration zone to calculate the infiltration loading rate and the linear loading rate from the limiting condition, as well as, the limiting layer was not accurately identified (Pages 108-109 of The Record).
55. There has been a change to the direction of the laterals from what was submitted in the permit application.
56. The SOP does not include a prescriptive requirement to use the most limiting layer for the determination of both the infiltration and hydraulic linear loading rates; however, the industry interpretation in Alberta and supported by Municipal Affairs has been to use the most limiting layer to calculate both loading rates.
57. The permit application was based on the soil log from Test Pit 1 (Page 75 of The Record), which is now disputed as a hard consistency was noted at horizon B2 and this creates a restrictive layer that affects the system design.
58. The linear loading rate of 3 gal/day/ft, identified in the permit application, is not in accordance with Table A.1.E.1. for a layer of clay loam, blocky 2.
59. The permit application requires resubmission with updated soil logs and a revised design given the potential error in the soil logs and the change in location of the laterals.

Reasons for Decision:

60. On an appeal such as this, the powers of the Tribunal are set out in subsection 52(2) of the *Act*, the relevant excerpt is reproduced below:

52(2) The Council may by order

- (b) confirm a refusal or direct that a designation, certificate or permit be issued and direct the inclusion of terms and conditions in the designation, certificate or permit,

61. The Refusal was pursuant to subsection 26(b) of the *Permit Regulation, AR 204/2007*:

26 Without restricting the generality of section 46 of the *Act*, a permit issuer may refuse to issue a permit and, without restricting the generality of section 44 of the *Act*, a safety codes officer may suspend or cancel a permit that has been issued if ...

- (b) incorrect or insufficient information is submitted with respect to the permit or the undertaking to be governed by the permit,

62. The Tribunal finds based on the evidence before it that the SCO had incorrect or insufficient information with respect to the permit application. Both parties acknowledge that the location of the laterals had changed from the original permit application, as well as, a potential error in the soil logs from 2019, as a hard consistency was noted in both test pits.

63. Taking into consideration the required redesign and updated soil logs, a reassessment of the loading rates may be involved. Therefore, the Tribunal confirms the Refusal based on the information provided.
64. Furthermore, given this matter also involves the interpretation of the SOP with respect to the layer used to determine the loading rates, a safety codes officer is given the authority and discretion to issue permits under the Act and any guidance provided by Municipal Affairs regarding interpretation of codes and standards shall be given deference, barring a relevant STANDATA or code update to the SOP. A request for a variance may be an alternative to enabling the issuance of a permit for this subject property; however, this too is at the discretion of a safety codes officer where an approximately equal or greater level of safety is achieved by the alternate solution.

Signed at the City of Lethbridge)
in the Province of Alberta)
this 27th day of April, 2022)

[REDACTED]
Chair, Plumbing Sub-Council Administrative Tribunal