Where:
- \( EF_{\text{LKD},i,n} \) = Emission factor for sold lime by-product/waste type \( i \), for month \( n \) (metric tons \( \text{CO}_2 \)-ton lime byproduct).
- \( SR_{\text{CaO}} \) = Stoichiometric ratio of \( \text{CO}_2 \) and \( \text{CaO} \) for calcium carbonate (see Table S–1 of this subpart) (metric tons \( \text{CO}_2 \)-metric tons \( \text{CaO} \)).
- \( SR_{\text{MgO}} \) = Stoichiometric ratio of \( \text{CO}_2 \) and \( \text{MgO} \) for magnesium carbonate (see Table S–1 of this subpart) (metric tons \( \text{CO}_2 \)-metric tons \( \text{MgO} \)).
- \( \text{CaO}_{\text{LKD},i,n} \) = Calcium oxide content for sold lime byproduct/waste type \( i \), for month \( n \) (metric tons \( \text{CaO} \)/metric ton lime).
- \( \text{MgO}_{\text{LKD},i,n} \) = Magnesium oxide content for sold lime byproduct/waste type \( i \), for month \( n \) (metric tons \( \text{MgO} \)/metric ton lime).
- \( 2000/2205 \) = Conversion factor for metric tons to tons.

(iii) You must calculate the annual \( \text{CO}_2 \) emissions from each type of by-product/waste that is not sold (including lime kiln dust and scrubber sludge) using Equation S–3 of this section:

\[
E_{\text{waste},i} = \left[ \left( SR_{\text{CaO}} \times \text{CaO}_{\text{waste},i} \right) + \left( SR_{\text{MgO}} \times \text{MgO}_{\text{waste},i} \right) \right] \times \frac{M_{\text{waste},i}}{2000} \times \frac{2000}{2205} \quad \text{(Eq. S-3)}
\]

where:
- \( E_{\text{waste},i} \) = Annual \( \text{CO}_2 \) emissions for unsold lime byproduct/waste type \( i \) (metric tons \( \text{CO}_2 \)).
- \( SR_{\text{CaO}} \) = Stoichiometric ratio of \( \text{CO}_2 \) and \( \text{CaO} \) for calcium carbonate (see Table S–1 of this subpart) (metric tons \( \text{CO}_2 \)-metric tons \( \text{CaO} \)).
- \( SR_{\text{MgO}} \) = Stoichiometric ratio of \( \text{CO}_2 \) and \( \text{MgO} \) for magnesium carbonate (see Table S–1 of this subpart) (metric tons \( \text{CO}_2 \)-metric tons \( \text{MgO} \)).
- \( \text{CaO}_{\text{waste},i} \) = Calcium oxide content for unsold lime byproduct/waste type \( i \) (metric tons \( \text{CaO} \)/metric ton lime).
- \( \text{MgO}_{\text{waste},i} \) = Magnesium oxide content for unsold lime byproduct/waste type \( i \) (metric tons \( \text{MgO} \)/metric ton lime).
- \( M_{\text{waste},i} \) = Annual weight or mass of unsold byproducts/wastes for lime type \( i \) (tons).
- \( 2000/2205 \) = Conversion factor for metric tons to tons.

(iv) You must calculate annual \( \text{CO}_2 \) process emissions for all kilns using Equation S–4 of this section:

\[
E_{\text{CO}_2} = \sum_{i=1}^{t} \sum_{n=1}^{12} \left( EF_{\text{LIME},i,n} \times M_{\text{LIME},i,n} \right) + b \sum_{i=1}^{z} \sum_{n=1}^{12} EF_{\text{LKD},i,n} \times M_{\text{LKD},i,n} + \sum_{i=1}^{z} E_{\text{waste},i} \quad \text{(Eq. S-4)}
\]

where:
- \( E_{\text{CO}_2} \) = Annual \( \text{CO}_2 \) process emissions from lime production from all kilns (metric tons/year).
- \( EF_{\text{LIME},i,n} \) = Emission factor for lime type \( i \), in calendar month \( n \) (metric tons \( \text{CO}_2 \)/ton lime) from Equation S–2 of this section.
- \( M_{\text{LIME},i,n} \) = Weight or mass of lime type \( i \) in calendar month \( n \) (tons).
- \( EF_{\text{LKD},i,n} \) = Emission factor of byproducts/wastes sold for lime type \( i \) in calendar month \( n \) (metric tons \( \text{CO}_2 \)/ton byproduct/waste) from Equation S–2 of this section.
- \( M_{\text{LKD},i,n} \) = Monthly weight or mass of byproducts/wastes sold (such as lime kiln dust) for lime type \( i \) in calendar month \( n \) (tons).
- \( E_{\text{waste},i} \) = Annual \( \text{CO}_2 \) emissions for unsold lime byproduct/waste type \( i \) (metric tons \( \text{CO}_2 \)) from Equation S–3 of this section.
- \( t \) = Number of lime types
- \( b \) = Number of byproducts/wastes sold
- \( z \) = Number of byproducts/wastes not sold

(v) Calculate and report under subpart C of this part (General Stationary Fuel Combustion Sources) the combustion \( \text{CO}_2 \) emissions from each lime kiln according to the applicable requirements in subpart C.

§ 98.194 Monitoring and QA/QC requirements.

(a) You must determine the total quantity of each product type of lime and each calcined byproduct/waste (such as lime kiln dust) that is sold. The quantities of each should be directly measured monthly with the
§ 98.196 Data reporting requirements.
In addition to the information required by §98.3(c), each annual report must contain the information specified in paragraphs (a) or (b) of this section, as applicable.

(a) If a CEMS is used to measure CO₂ emissions, then you must report under this subpart the relevant information required by §98.36 and the information listed in paragraphs (a)(1) through (a)(8) of this section.

1. Method used to determine the quantity of lime sold.
2. Method used to determine the quantity of lime byproduct/waste sold.
3. Beginning and end of year inventories for lime byproducts/wastes.
4. Beginning and end of year inventories for lime products.
5. Annual amount of lime byproduct/waste sold, by type (tons).
6. Annual amount of lime product sold, by type (tons).
7. Annual amount of lime byproduct/waste not sold, by type (tons).
8. Annual amount of lime product not sold, by type (tons).

(b) If a CEMS is not used to measure CO₂ emissions, then you must report the information listed in paragraphs (b)(1) through (b)(17) of this section.

1. Annual CO₂ process emissions from all kilns combined (metric tons).