

Date: May 11, 2023

1. Describe the rule, including: a brief history of the issue; an explanation of why the rule is needed; and a brief description of the amendments that would impose new or additional costs on affected businesses, including small businesses.

For the past several summers, L&I's Division of Occupational Safety and Health (DOSH) received inquiries about wildfire smoke hazards, especially for outdoor workers. DOSH has put out guidance and information on best practices but recognizes there has been a gap under previous rules to adequately protect workers from this hazard and to ensure employers and workers understand what is required. After the unprecedented wildfire smoke events in 2020, L&I reviewed the need for rules and received and accepted a petition requesting rulemaking.

Wildfire smoke is composed of harmful chemicals and tiny particles suspended in the air that present a significant health hazard for workers exposed to it. A major component of wildfire smoke is particulate matter with an aerodynamic diameter less than 2.5 micrometers (PM_{2.5}). These particles can irritate the lungs and cause serious or even fatal health effects, such as reduced lung function, bronchitis, worsening of asthma, and heart failure. Compared with the general public, workers have additional risk factors in that they may spend more time outdoors in the smoke, and have more physical exertion, which increases the amount of smoke that they breathe into their lungs. Individuals considered sensitive to wildfire smoke exposure, such as those with asthma and those who work outdoors, are part of the workforce.

The proposed rules accomplish the following:

- Set the scope of the rule, which primarily apply to outdoor workplaces, and enumerate exemptions
- Add applicable definitions relating to wildfire smoke
- Create provisions to address methods that can be used by the employer to determine employee exposures to PM_{2.5}
- Require employers to establish and implement a system for communicating wildfire smoke hazards in a form readily understandable by all affected employees, and include provisions designed to encourage employees to inform the employer of wildfire smoke hazards at the worksite without fear of reprisal.
- Set a requirement for employers to provide all workers with effective information and training regarding wildfire smoke before work that exposes the worker to a PM_{2.5} concentration of 20.5 µg/m³ (AQI 69) or more, and annually thereafter.
- Create provisions that require employers to monitor employees displaying symptoms of wildfire smoke exposure, allow employees to seek medical treatment, have effective provisions for prompt medical treatment of employees who display adverse symptoms of wildfire smoke exposure
- Where the current PM_{2.5} is 250.5 µg/m³ (AQI 301) or higher, require that workers experiencing adverse symptoms requiring medical attention be moved to a location that ensures sufficient clean air.
- Where the current PM_{2.5} is 35.5 µg/m³ (AQI 101) or more, create a requirement for employers to implement exposure controls.
- Establishes respiratory protection requirements:
 - Where the current PM_{2.5} is 35.5 µg/m³ (AQI 101) to 250.4 µg/m³ (AQI 300), create a requirement for employers to provide N95 filtering-facepiece respirators at no cost to all exposed employees.
 - Where the current PM_{2.5} is 250.5 µg/m³ (AQI 301) to 500.3 µg/m³ (AQI 499), create a requirement for employers to distribute N95 filtering-facepiece directly to each exposed employee.
 - Where the current PM_{2.5} is 500.4 µg/m³ (AQI 500) to 554.9 µg/m³ (beyond the AQI), create a requirement for employers to have employees enrolled in a complete respiratory program in accordance with chapter 296-842, Respirators. Use of respirators is mandatory at this threshold.

- Where the current PM_{2.5} is 555 µg/m³ (beyond the AQI) or more, create a requirement for employers to have employees enrolled in a complete respiratory program in accordance with chapter 296-842, Respirators; at this threshold, the employer must provide and require to be worn a respirator equipped with P100 filters.

2. Identify which businesses are required to comply with the rule using the North American Industry Classification System (NAICS).

The proposed rule applies to all employers with employees who are outdoors and are likely exposed to wildfire smoke. As discussed in the Section 1.6.1 of the Cost-Benefit Analysis (CBA), L&I used outdoor exposure data from Bureau of Labor Statistics (BLS) Occupational Requirements Survey (ORS) to determine the number of workers affected. Using the number of affected workers in each occupation estimated in Section 1.6.1 in the Cost-Benefit Analysis (CBA) for this rulemaking, and their employment by each industry, L&I was able to estimate the number of businesses in each industry that are likely affected by this proposed rule (see Table 2.1).¹

Table 2.1. Share and number of businesses that are likely impacted in each industry

NAICS	Sector	Share of affected businesses	Number of affected businesses	Affected businesses as % of total affected
11	Agriculture, Forestry, Fishing and Hunting	53.3%	3,592	10.9%
21	Mining, Quarrying, and Oil and Gas Extract	22.2%	30	0.1%
22	Utilities	16.7%	39	0.1%
23	Construction	46.1%	13,443	40.9%
31-33	Manufacturing	6.7%	534	1.6%
42	Wholesale Trade	12.6%	1,599	4.9%
44-45	Retail Trade	6.0%	887	2.7%
48-49	Transportation and Warehousing	22.2%	1,153	3.5%
51	Information	3.4%	201	0.6%
52	Finance and Insurance	3.1%	208	0.6%
53	Real Estate and Rental and Leasing	16.8%	1,254	3.8%
54	Professional, Scientific, and Technical Services	2.9%	972	3.0%
55	Management of Companies and Enterprises	2.1%	14	0.0%
56	Administrative, Support and Waste Mgmt.	25.5%	3,511	10.7%
61	Educational Services	5.9%	231	0.7%
62	Health Care and Social Assistance	2.9%	1,841	5.6%
71	Arts, Entertainment, and Recreation	13.5%	426	1.3%
72	Accommodation and Food Services	4.4%	679	2.1%
81	Other services except public administration	9.4%	1,946	5.9%
99	State and Local Governments	14.1%	292	0.9%
	Overall	11.9%	32,850	100.0%

¹ Assuming the share of affected workers in a certain industry is similar to that of affected businesses in that industry.

3. Identify and analyze the probable costs to comply with the adopted rule.

3.1 Cost of identification of harmful exposures

WAC 296-820-815 and 296-307-09815 require employers to determine employee PM_{2.5} exposure levels at worksites periodically as needed. Employers have options in the methods used to collect this information including: (1) check PM_{2.5} forecasts and current levels from one of seven sources;² (2) obtain PM_{2.5} forecasts and current levels directly from one of four sources by either telephone, email, text, or other effective methods;³ or (3) measure current PM_{2.5} levels at the worksite in accordance with WAC 296-820-845 and 296-307-09845.⁴

In order to estimate the cost of this requirement L&I looked at the amount of time it would take to determine the PM_{2.5} levels as well the frequency of checks. Each option would require administrative time in order to obtain the necessary information. The number of checks would occur with greater frequency as the PM_{2.5} levels rise and health risk increases due to exposure. This would predominantly occur during the wildfire season (July to September)⁵ where the PM_{2.5} levels would most likely be at the trigger levels outlined in the section and be related to wildfire smoke. Based on internal technical staff estimates employers would spend about one minute checking PM_{2.5} levels and would do so at an increasing frequency as the PM_{2.5} levels increase.⁶

Analysis of historical PM_{2.5} data for the wildfire season show that for more than 96% of the time PM_{2.5} concentrations were below 20.5 µg/m³. Examination of levels above 20.5 µg/m³ show that about 64 hours when levels were 20.5 to 35.4 µg/m³, 85 hours when it was between 35.5 to 250.4 µg/m³, 3.0 hours when it was between 250.5 to 500.3 µg/m³, and 1 hour when the PM_{2.5} levels were at or above 500.4 µg/m³ (see Table 3.1).

Table 3.1 Average number of hours and frequency of PM_{2.5} checks

PM _{2.5} level at	Number of hours per wildfire season	Frequency of checks	Number of checks per season
20.5 - 35.4 µg/m ³	64	every 4 hours	16
35.5 - 250.4 µg/m ³	85	every 2 hours	43
250.5 - 500.4 µg/m ³	3.0	every 2 hours	2.0
>= 500.5 µg/m ³	1.0	every hour ⁷	1.0

² These include Washington Department of Ecology website, Air Quality WA mobile app, Washington Smoke Information website, U.S. EPA AirNow website, U.S. EPA AirNow mobile app, U.S. Forest Service AirFire website, or Local Clean Air Agency website.

³ The four sources include the Department of Ecology, Local Clean Air Agency, U.S. EPA, or U.S. EPA EnviroFlash.info.

⁴ These sections provide the guidance employers must follow when measuring PM_{2.5} levels directly at worksites. This includes guidance on the design and manufacturing specifications of the monitor used to measure particulate levels, and the training requirement for the person(s) supervising, directing, or evaluating the monitoring, among others.

⁵ According to the Emergency Management Division, the wildland fire season in Washington usually begins in early July and typically culminates in late September.

⁶ This time would vary depending on various reasons, for instance the method the employer uses to obtain measures.

⁷ For ease of assessing costs, L&I rounded the number of checks at this concentration to 1.

In estimating costs L&I uses an eight year forward period (2023-30) and discounts back to present day figures using the 5% social discount rate, going forward referred to as the model period. L&I relies upon two main assumptions to estimate these costs. First, in order to determine the concentration levels of the day, employers would have to check at least once every day for the total of 153 days in each wildfire season, most likely at the beginning of the work day. Second, L&I assumes that the number of checks needed during the day in addition to the initial check is dependent upon the daily maximum concentration level (see Table 3.1) from historical data. Given the average monitoring time, and the hourly wage of a typical supervisor of \$67.16, the estimated cost to impacted businesses to determine PM_{2.5} levels would be \$2.1 million each year.⁸

The method used by an employer to determine the PM_{2.5} levels would most likely involve either the use of a mobile device, a computer with access to the internet, or special dedicated measuring equipment. The first two methods would impose none to minimal device cost since typical employers would most likely have such a device, even in most remote sites. For employers with remote worksites which are unconnected to the internet and without cellular service, employees would probably have to directly monitor PM_{2.5} exposures with a dedicated device. The number of employees at those remote worksites who would need devices to do the direct measurement is estimated to be relatively small at 4,178 over the next eight years. However, given that the measurement choices that an employer can use are options and not requirements, we assume no device costs for this proposed requirement.

Table 3.2 Cost of identification of harmful exposure

Cost factor		
Monitoring time	Minimum number of checks per wildfire season	153
	Additional number of checks per wildfire season	
	20.5 - 35.4 µg/m ³	16
	35.5 - 250.4 µg/m ³	43
	250.5 - 500.4 µg/m ³	2.0
	>= 500.5 µg/m ³	1.0
	Average time to monitor the PM _{2.5} levels	1 minute
	Employee hourly wage plus benefit	\$67.16
	Total monitoring cost over 8 years	\$19,026,455
Annualized	\$2,128,351	

3.2 Cost of hazard communications

WAC 296-820-820 and 296-307-09820 require employers to establish and implement a system for communicating the hazards of wildfire smoke in a form understandable by employees. Such a system must include procedures for (1) informing employees of the current PM_{2.5} when at least two consecutive current PM_{2.5} readings meet or exceed a certain threshold; (2) enabling and encouraging employees to inform employers of (a) worsening air quality, (b) availability issues of appropriate exposure control measures, and (c) adverse wildfire smoke exposure symptoms; and (3) a wildfire smoke response plan tailored to the workplace which must include at least nine listed minimum elements. This wildfire smoke response plan must also be included in the written accident prevention program (APP).

Impacted businesses would incur new costs to create the necessary procedures for communicating with employees when trigger thresholds are met, and procedures for employees to communicate worsening air quality, issues with exposure control

⁸ The discount rate is 5%.

measures with employers, and any adverse wildfire smoke symptoms. The costs that employers are expected to incur include (1) the cost of creating the system for communication, broken down by (i) administrative time, and (ii) cost of any necessary assets; and (2) creation of a wildfire Smoke Response Plan (WSRP).

System for communication

Creating any system for communication involves several stages including planning, design, implementation, testing, and deployment. The time and asset requirements of each depends on the complexity of the system. The requirements of this section makes this one a relatively simple communication system and is not expected to use any significant amount of time or assets.

L&I believes that a significant number of employers already have a communication system in place which satisfies the requirements of the proposed communication system here. The remaining number of businesses who would need to create this system is assumed to be relatively small. To determine the cost of this requirement to those impacted businesses, we first assess the administrative time needed to complete the system. Based on the variability of different business operations, L&I believes it would take approximately 2 to 3 hours to complete the various stages involved in the procedures.⁹ Assuming that 80-90% of current employers have an existing communication system, and using the average hourly wage of \$95.14 for a typical manager,¹⁰ the cost to complete the procedures is estimated to be \$148,072 to \$386,104 annualized over the model period.

Next we analyzed possible asset requirements. In addition to communicating in-person, employers would most likely use existing communication devices like radios or cellular telephones to facilitate communication between themselves and employees. L&I believes there would be no or minimal cost for communication devices since most all employees would have at least a mobile phone equipped to receive and send voice and text messages. However, there may be a number of employees who are working remotely in locations with no cellular service and where a radio would be the most viable communication device. As mentioned in section 2.2.1 above, L&I estimates the number of these employees to be approximately 4,178 over the next eight years. On the high end of our estimates, if all of these workers require a device for communication then this results in a total of 8,356 devices being needed.¹¹ However, as we assume that 80-90% of businesses already have a system in place, we assume that on the low end approximately 10% of these workers would need a device, which results in 836 devices. Based on the average price of a long-range radio of \$64.62, L&I estimates a cost of \$6,628 to \$66,278 on impacted businesses each year over the model period. Overall, the administrative time for communication procedures plus the equipment cost are expected to impose approximately \$154,700 to \$452,382 each year.

Wildfire smoke response plan

Employers would also incur costs of creating a WSRP and including this plan in their written Accident Prevention Program (APP). L&I provides a template that employers could use to quickly complete their plan. Assuming the typical employer utilizes this template, internal staff estimates creating a typical WSRP would take on average 1 to 2 hours. Using the same average hourly wage of an employee most likely responsible for creating this plan of \$95.14, L&I estimates the annualized cost to impacted businesses to be \$381,836 to \$763,671. Including this plan in the written APP would simply entail updating the APP with this information, and this is not expected to take any significant time.

⁹ Estimates based on internal technical staff advice.

¹⁰ This hourly wage represents the average median starting wage plus benefits of 30.4% of employees most likely responsible for completing this task

¹¹ This assumes one device for the employee and one device for the employer to facilitate the two-way communication. This represents the upper end of probable devices needed.

Overall, the total cost of compliance with this requirement for impacted businesses is estimated to be \$0.5 million to \$1.2 million each year over the model period (see Table 3.3).

Table 3.3 Cost of hazard communication

Cost factor		
Communication system	Number of employers requiring a new system	6,909 - \$10,085
	Procedures	
	Average time to complete communication procedures	2 - 3 hours
	Hourly rate of an employee completing procedures	\$95.14
	Total cost of creating and implementing procedures	\$1,105,095 - \$2,881,573
	Devices	
	Number of workers needing devices	418 - 4,178
	Total device cost	\$64.62
	Total cost in 8 years	\$49,490 - \$494,895
Wildfire smoke response plan	Total number of firms needing a WSRP	35,494
	Average time to complete a WSRP	1 - 2 hours
	Hourly wage of employee completing WRSP	\$95.14
	Total cost of WSRP	\$2,916,482 - \$5,832,964
Overall	Total cost range in 8 years	\$4,071,066 - \$9,209,433
	Annualized cost	\$536,536 - \$1,216,053

3.3 Cost of information and training

WAC 296-820-825 and 296-307-09825 require employers to provide workers with information and training prior to work which exposes them to PM_{2.5} concentration of at least 20.5 µg/m³ (AQI 69) and at least annually thereafter. This training includes a minimum eight components contained within the full Appendix A of the proposed rule. Employers are required to provide this training in a manner and language readily understandable by the employee. In addition, these sections also require supervisors to be provided information and training at similar concentration levels, on requirements in WAC 296-820-825(2) plus procedures they must follow to (a) implement the provisions of WAC 296-820-805 through 296-820-860 (and 296-307-09805 through 296-307-09860); (b) if an employee exhibits adverse wildfire smoke symptoms; and (c) to move or transport employees to an emergency medical service provider, if necessary.

The proposed sections would impose a new cost on businesses that need to train their employees and supervisors. Cost of compliance with this section was broken down into two parts: (1) cost of developing the training material, and (2) cost of providing the required training to employees and supervisors. Based on internal technical staff estimates, impacted businesses are expected to spend 2 to 4 hours developing the necessary training material. Using an average hourly wage of \$95.14 of an employee most likely completing this task, L&I estimates one-time cost of \$5.8 million to \$11.7 million on impacted businesses, or \$763,671 to \$1,527,342 each year when annualized over the model period. Providing this training material in a language understood by employees imposes translation costs upon impacted businesses. The distribution of workers with limited English proficiency across all impacted industries is not known. While the Agriculture, Forestry, Fishing and Hunting,

and Construction industries would have workers who do not understand English and would need translation services, not all businesses in these sectors will need translation services. For the purposes of this analysis, we assume all businesses in these two sectors, 52% of total impacted businesses, would need translation services to address employers across all industries. This approach implies that the associated costs are probably over estimated. Using the average cost of \$20 to \$75 for translation services for each affected business, L&I estimates this to impose annualized cost of \$43,477 to \$163,037 over the model period to these affected businesses.

To estimate the cost of training employees and supervisors, L&I determined the number of those workers who would need training annually and the average amount of time this training would take. Using the average hourly wage of \$55.70 for non-supervisory workers and, \$67.16 for supervisors, plus the average training time of 30 minutes for initial training and 15 minutes for subsequent trainings, L&I estimates this requirement would impose approximately \$6 million upon impacted businesses each year. The total cost of information and training is estimated to cost impacted businesses \$6.8 million to \$7.7 million each year over the model period (see Table 3.4).

Table 3.4 Cost of information and training

Cost factor		
Training development	Total number of employers	35,494
	Average time to develop training materials	2 - 4 hours
	Hourly wage of manager	\$95.14
	Total cost	\$5,832,964 - \$11,665,929
	Annualized	\$763,671 - \$1,527,342
Translation services	Average number of employers	16,224
	Average cost of translation services	\$20 - \$75
	Total cost	\$324,475 - \$1,216,780
	Annualized	\$43,447 - \$163,037
Employee training	Number of employees over 8 years	435,361
	Average initial training time	30 minutes
	Average subsequent training time	15 minutes
	Hourly wage of employee	\$55.70
	Total cost	\$51,841,108
	Annualized	\$5,906,118
Supervisor training	Average number of supervisors each year	4,709
	Supervisor hourly wage	\$67.16
	Total cost	\$674,180
	Annualized	\$76,774
Overall	Total cost in 8 years	\$57,994,952 - \$63,941,726
	Annualized cost	\$6,790,040 - \$7,673,272

3.4 Cost of respiratory protection

WAC 296-820-840 and 296-307-09840 addresses employer requirements regarding respiratory protection. L&I only assessed the components of these sections which have a cost implication for impacted businesses. First, at PM_{2.5} levels of 35.5 µg/m³ (AQI 101) to 250.4 µg/m³ (AQI 300) employers must provide, and encourage the use of, N95 filtering-facepiece respirators to all exposed employees either directly or by maintaining a sufficient supply at each worksite where exposure occurs. Second, at PM_{2.5} levels of 250.5 µg/m³ (AQI 301) to 500.3 µg/m³ (AQI 499) employers must distribute N95 filtering-facepiece respirators directly to each exposed employee. Similar to the first requirement, employers must also encourage the use of the respirator by exposed employees. Third, PM_{2.5} levels of 500.4 µg/m³ (AQI 500) to 554.9 µg/m³ (beyond the AQI) require employees to be enrolled in a complete Respiratory Protection Program (RPP). Employers must provide, and require the wearing of, either (a) N95 filtering-facepiece respirator, (b) half-facepiece air purifying respirator equipped with P100 filters, or (c) other respirators equipped with P100 filters with an assigned protection factor (APF) of 10 or greater. At this threshold employees who are exposed for a total of 15 minutes or less during a 24-hour period are exempt. Fourth, where the current PM_{2.5} level is at least 555 µg/m³ employees must be enrolled in a complete respiratory protection program (in accordance with chapter 296-842 WAC). At these levels, employers must provide, and require to be worn, a respirator equipped with a P100 filter which is either a (a) loose-fitting powered air purifying, (b) full-facepiece air purifying, (c) full-facepiece powered air purifying, or (d) other respirators with an APF of 25 or more, such that the PM_{2.5} levels inside the respirator are less than 55.5 µg/m³. See Table 3.5 for a list of the respirator requirements at the stated thresholds.

Table 3.5 Respirator requirements at different PM_{2.5} thresholds¹²

Respirator options	PM _{2.5} µg/m ³			
	35.5 - 250.4	250.5 - 500.3	500.4 - 554.9	≥ 555
N95 filtering-facepiece	*	*	*	
Half-facepiece air purifying respirator equipped with P100 filter			*	
Other respirator equipped with P100 filter with an APF of at least 10			*	
Loose-fitting powered air purifying respirator w/ P100 filter				*
Full-facepiece air purifying respirator w/P100 filter				*
Full-facepiece powered air purifying respirator w/P100 filter				*
Other respirator with an APF of at least 25				*

Below we address each requirement within this subsection for cost implication.

i. PM_{2.5} levels of 35.5 µg/m³ (AQI 101) to 250.4 µg/m³ (AQI 300)

Compliance with this proposed subsection would require employers to purchase and have available for use N95 respirators for all exposed employees. Here employers are not required to distribute the respirators but simply to provide them and encourage employees to use them. The cost of compliance would be for the purchase of the respirators. The total number of

¹² At each PM level, the asterisk (*) indicates which respirator is an option the employee could use.

respirators needed is a function of how many days those respirators would be needed and how many employees would need them. Historical data shows there were an average of 9.64 days during wildfire season that the daily maximum PM_{2.5} was in this range,¹³ and L&I assumes this will not change significantly over the next few years. The number of exposed employees at these levels is estimated at 316,339 annually over the next eight years. Each employee is assumed to require one mask per work day. Given the average cost of a typical N95 respirator of \$0.40 to \$1.40, the number of impacted employees, and the typical number of days when the PM_{2.5} levels are at the trigger threshold, L&I estimates impacted businesses would incur approximately \$857,959 to \$3,002,856 each year over the model period.

ii. PM_{2.5} levels of 250.5 µg/m³ (AQI 301) to 500.3 µg/m³ (AQI 499)

This subsection requires employers to distribute N95 respirators directly to each exposed employee. L&I anticipates that not all respirators purchased by employers as a result of requirement (i) above would have been used by employees as they are encouraged, but not required, to use them at that specific PM_{2.5} level, and there would be a sufficient quantity of N95 respirators available to be distributed to employees exposed at concentration listed in this subsection. Therefore, there is no cost for purchasing additional respirators and any new cost associated with this requirement would be the time it takes the employer to actually distribute the respirators. Distributing respirators directly to employees is not expected to take any significant time as employers would simply place the respirators in a common area and instruct employees to take one, or hand them out at the beginning of each shift. As a result L&I estimates this would impose minimal to no cost on impacted businesses.

iii. PM_{2.5} levels of 500.4 µg/m³ (AQI 500) to 554.9 µg/m³ (beyond the AQI)

At this PM_{2.5} level, employers are required to enroll impacted employees in a complete respiratory protection program (RPP) in accordance with chapter 296-842 WAC. Employers must also provide and require to be worn either (a) N95 filtering-facepiece respirators, (b) half-facepiece air purifying respirators equipped with P100 filters, or (c) other P100 filter equipped respirator with assigned a protection factor of at least 10.

Consistent with prior sections, L&I assessed cost for this component on an 8 year model period. This requirement imposes two main cost components on impacted businesses – (1) cost of the respirators; and the cost of enrolling employees in a RPP, and its associated costs.

First, we determined how many employees would likely be exposed at these PM_{2.5} concentrations. The increasing risk of negative health effects with each increase in PM_{2.5} levels, means that the number of workers exposed at higher levels of PM_{2.5} concentrations would be lower/reduced as employers act to address worker safety or because of operational constraints. As PM_{2.5} levels rise to this extremely hazardous level L&I believes that there would be a specific set of occupations or employees deemed mission critical who would not necessarily be able to avoid work in these conditions. These are expected to constitute a very small number, on average 5% in certain industries, of total impacted workers. We estimate on average 875 employees would be exposed at these levels each year.

In addition to the N95 filtering-facepiece respirators, employers would need to provide the option of the two other types of respirators on exposure days. In estimating a reasonable cost of this requirement, L&I assumes an average of one day each year when the PM_{2.5} concentration was in this range, which is much higher than the historical data indicates. L&I also assumes that two N95 respirators would be needed per employee. Using this average number of days, the number of exposed

¹³ This represents the calendar days. L&I used business days (calendar days minus weekends and holidays) in the calculation of the cost impact.

employees, and the average cost of the respirator options, L&I estimates this would impose new cost of about \$689 to \$30,761 each year on impacted businesses each year over 8 years (see Table 3.6).¹⁴

Next, we determined the RPP cost component. The RPP into which employees must be enrolled has several aspects which would probably impose a cost on impacted businesses. These include development of a written program, medical evaluations, conducting fit-tests, and training. The probable costs an employer would face depend on the actual number of employees who need to be enrolled in the RPP.

PM_{2.5} levels of 250.5 µg/m³ (AQI 301) and above are considered hazardous with caution for everyone to avoid outdoor exertion, so fewer workers would be exposed at PM_{2.5} concentrations of 500.4 µg/m³ to 554.9 µg/m³. At those concentrations most employers would either stop work or implement some level of exposure control, like adjusting working schedules. We assume that approximately 25% of employers would be subject to work in these conditions. At such elevated PM_{2.5} levels, most of those impacted employers would most likely already have an established respiratory protection program as per requirements of chapter 296-842 WAC. L&I believes that only a small number, 5-10% of these employers would need to fully create and enroll employees in an RPP.

To estimate the cost to impacted businesses, L&I assessed the RPP components starting with the development and maintenance of a written program (WAC 296-842-12005). Given the assumptions to the number of impacted businesses and the average time of 2 to 4 hours to complete a typical written program, L&I estimates this component of the RPP to impose approximately \$9,044 to \$36,178 annualized on impacted businesses.

Medical evaluations

WAC 296-842-14005 outline the scope of the medical evaluations. L&I assumes that employees will either use an online/virtual service for their medical evaluation or it can be an employer conducted one. Medical evaluations must be done before each fit-test. Since fit-testing must be done at least annually, then medical evaluations will also be an annual requirement. Given the nature of the evaluation, L&I believes that businesses within the health and safety industry would have the necessary competencies and qualifications to conduct their own evaluations. All other industries are assumed to use an online or virtual option. The number of employees who would be part of an employer conducted evaluation is estimated to be approximately 1,087 over the 8 years. Given the average time of 15 to 20 minutes to complete an evaluation, the hourly wage of \$55.70 and \$94.04 for an employee and evaluator respectively, L&I estimates this component to impose approximately \$4,568 to \$6,091 annually on impacted businesses. The number of employees likely to complete an online evaluation is estimated to be 5,916. Using an average online cost of \$29.00 for medical evaluations, \$55.70 for employee wages, and 15 to 20 minutes per evaluation, the estimated annualized cost is approximately \$293,225 to \$390,966.

Fit-testing

WAC 296-842-15005 outlines the scope of the fit-testing requirements. This subsection requires, among other things, that a quantitative fit-test be conducted at least twelve months after initial testing. In determining the cost of fit-testing to impacted businesses, L&I used an average cost of \$30 to \$80 for a quantitative fit test, an employee hourly wage of \$55.70 and an average time to complete a fit-test of 15 to 20 minutes. Based on these, L&I estimates annualized cost of \$34,740 to \$74,388 for fit-testing.

Provide effective Training

WAC 296-842-16005 outlines the provisions and requirements around the training employees must receive. This is an annual requirement with which employees must comply. From the WAC description L&I estimates this training will take about 15

¹⁴ Due to the uncertainty of the degradation/replacement rate of the P100 filter which is based on the variability of its use, L&I did not factor the cost of replacement P100 filters into this analysis.

to 30 minutes per impacted employee per year. The number of impacted employees over the 8 year model period is approximately 7,003. Using the same employee hourly wage as above, plus the average time per training, L&I estimates this requirement to impose about \$10,950 to \$21,901 annualized on impacted businesses.

Based on the number of required respirators, and the individual components of the RPP enrollment likely to impose a cost, L&I estimates this aspect to cost employers approximately \$353,216 to \$560,285 each year over the model period (see Table 3.6).

Table 3.6 Respirator & enrollment cost at PM_{2.5} levels of 500.4 µg/m³ to 554.9 µg/m³

Cost factors		
Respirators	Number of days when PM _{2.5} was 500.4 to 554.9 µg/m ³	1
	Number of employees impacted	7,003
	Average cost of an N98 face-filtering respirator	\$0.40 - \$1.40
	Average cost of an alternative respirator	\$19.33 - \$35.70
	Total cost of respirators	\$6,126 - \$273,356
	Annualized	\$689 - \$30,761
RPP enrollment	Written program	\$67,500 - \$270,002
	Employee medical evaluations	\$2,676,843 - \$3,569,123
	Quantitative Fit-testing	\$307,938 - \$690,689
	Effective training	\$97,860 - \$195,719
	Total cost of RPP enrollment	\$3,156,267 - \$4,621,293
	Annualized	\$352,527 - \$529,524
Overall	Total cost in 8 years	\$3,156,267 - \$4,998,889
	Annualized Costs	\$353,216 - \$560,285

iv. PM_{2.5} level is at least 555 µg/m³

For PM_{2.5} levels of at least 555 µg/m³, employers must also enroll employees in a complete RPP, and provide and require to be worn P100 filter-equipped respirators which are either (a) loose-fitting power air purifying, (b) full-facepiece air purifying, (c) full-facepiece powered air purifying, or (d) assigned a protection factor of 25 or more such that inside of the respirators would be less than 55.5 µg/m³.

Requirements of this proposed subsection confers on employers the responsibility to ensure employees impacted at these threshold are enrolled in an RPP. L&I believes there would be no cost for this aspect in this subsection since employees would have already been enrolled in an RPP for compliance in the previous subsection which has a lower threshold. As a result, the cost employers would incur from this requirement is that of providing the new respirators to address the risks of employee exposures at the higher PM_{2.5} levels. However, historical data shows there were no days when the PM_{2.5} concentrations were at this level over the last 5 years except a few days from certain location in 2020 and a total of 2 days from Okanogan County in 2021. Furthermore at these levels, L&I believes that similar to employer response in (iii) above, only mission critical or

emergency response employees would be exposed, and employers would most likely stop work or implement some other exposure control. As a result, impacted employers are not expected to incur any cost from this proposed requirement.

Total cost of respiratory protection

Overall, L&I estimates this to impose approximately \$1.2 to \$3.6 million each year on impacted businesses over the model period (see Table 3.7).

Table 3.7 Total annualized cost of respiratory protections

Cost factor	Annualized cost
Respirators	\$858,648 - \$3,033,617
RPP enrollment	352,527 - \$529,524
Total	\$1,211,176 - \$3,563,142

3.5 Summary of Total Compliance Costs of the Proposed Rule

Overall, the proposed rule is estimated to impose approximately \$10.7 million - \$14.6 million on all impacted businesses each year over the model period (see Table 3.8).

Table 3.8 Summary of total annualized costs

Requirement	Annualized cost
Identification of harmful exposures	\$2,128,351
Hazard communication	\$536,536 - \$1,216,053
Information and training	\$6,790,040 - \$7,673,272
Respiratory protection	\$1,211,176 - \$3,563,142
Total	\$10,666,102 - \$14,580,817

4. Determine whether or not the proposed rule will impose more than minor costs on businesses in an industry.

As analyzed above, L&I estimates the total cost of compliance with the proposed rule to be \$10.7 million to \$14.6 million each year for all the affected businesses. Based on this cost range and the share of affected businesses in each industry estimated in Section 2 (see Table 2.1), the average per-business cost of the proposed rule is in a range of \$196 to \$3,740 depending on

the specific industry to which a business belongs. Comparing this per-business cost to the minor cost threshold of 1 percent of annual payroll for each industry¹⁵ shows this unit cost is far below the minor cost threshold for all industries (see Table 4.1).

Table 4.1 Average Per Business Cost VS Minor Cost Threshold by industry

Industry	Per-business cost	Minor cost Threshold
Agriculture, Forestry, Fishing and Hunting (11)	\$380 - \$521	\$5,914
Mining, Quarrying, and Oil and Gas Extract (21)	\$332 - \$454	\$12,915
Utilities (22)	\$494 - \$682	\$28,354
Construction (23)	\$232 - \$314	\$5,852
Manufacturing (31-33)	\$650 - \$901	\$29,247
Wholesale Trade (42)	\$276 - \$375	\$10,604
Retail Trade (44-45)	\$614 - \$851	\$22,588
Transportation and Warehousing (48-49)	\$518 - \$715	\$15,969
Information (51)	\$587 - \$812	\$77,467
Finance and Insurance (52)	\$369 - \$506	\$19,916
Real Estate and Rental and Leasing (53)	\$235 - \$318	\$5,647
Professional, Scientific, and Technical Services (54)	\$214 - \$289	\$9,457
Management of Companies and Enterprises (55)	\$1,307 - \$1,824	\$93,730
Administrative and Support and Waste Management (56)	\$318 - \$435	\$8,421
Educational Services (61)	\$1,595 - \$2,227	\$5,617
Health Care and Social Assistance (62)	\$226 - \$306	\$4,513
Arts, Entertainment, and Recreation (71)	\$428 - \$589	\$5,647
Accommodation and Food Services (72)	\$386 - \$530	\$4,733
Other services except public administration (81)	\$196 - \$264	\$2,542
State and Local Governments (99)	\$2,672 - \$3,740	\$203,393
Overall	\$325 - \$444	\$11,968

As the results in Table 4.1 reveal, the average per-business cost is far less than the minor cost threshold of impacted businesses. Therefore, an SBEIS is not required for this rulemaking pursuant to RCW 19.85.030(1), and the information provided in Section 1 through Section 3 is sufficient to fulfill the requirements in the Regulatory Fairness Act (RCW 19.85). It is also worth noting that the information provided above serves the purpose of making this determination only, and should not be treated as the content of an official SBEIS report specified in Section 19.85.040 RCW of this law.

¹⁵ Based on the QCEW data for 2021 (most recent available) and adjusted to 2023 figures using 6.45% inflation rate.