



**RETURN BIDS TO:  
RETOURNER LES SOUMISSIONS À:**

Public Health Agency of Canada / Agence de la santé publique du Canada

**Attn:** Erin Massey  
**Email:** [erin.massey@canada.ca](mailto:erin.massey@canada.ca)

**REQUEST FOR PROPOSAL  
DEMANDE DE PROPOSITION**

Proposal To: Public Health Agency of Canada

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out thereof.

**Proposition à:**  
**Agence de la santé publique du Canada**  
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**Instructions : See Herein**  
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**Issuing Office – Bureau de distribution**  
Public Health Agency of Canada / Agence de la santé publique du Canada  
200, Eglantine Driveway  
Tunney's Pasture  
Ottawa Ontario K1A 0K9

<b>Title – Sujet</b> Investigation of Workplace Noise Exposure & Risk Assessment & Advice to Mitigate Risks	
<b>Solicitation No. – N° de l'invitation</b> 1000214392	<b>Date</b> November 18, 2019
<b>Solicitation Closes at – L'invitation prend fin à 2:00 pm</b> on / le – December 3, 2019	<b>Time Zone</b> Fuseau horaire EDT
<b>F.O.B. - F.A.B.</b>	
<b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à :</b> Name: Erin Massey Email: <a href="mailto:erin.massey@canada.ca">erin.massey@canada.ca</a> Telephone – téléphone : 613-941-2094	
<b>Destination – of Goods, Services, and Construction:</b> <b>Destination – des biens, services et construction :</b> See Herein – Voir ici	
<b>Delivery required - Livraison exigée</b> <b>See Herein – Voir ici</b>	
<b>Vendor/firm Name and address</b> <b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>	
<b>Facsimile No. – N° de télécopieur :</b> <b>Telephone No. – N° de téléphone :</b>	
<b>Name and title of person authorized to sign on behalf of Vendor/firm</b> <b>Nom et titre de la personne autorisée à signer au nom du fournisseur/de l'entrepreneur</b>	
<hr/> <b>(type or print)/ (taper ou écrire en caractères d'imprimerie)</b>	
<hr/> <b>Signature</b>	<hr/> <b>Date</b>



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## **PART 1 - GENERAL INFORMATION**

### **1.1 Security Requirements**

At the date of bid closing, the following conditions must be met:

- (a) the Bidder must hold a valid organization security clearance as indicated in Part 6 - Resulting Contract Clauses;
- (b) the Bidder's proposed individuals requiring access to classified or protected information, assets or sensitive work sites must meet the security requirements as indicated in Part 6 - Resulting Contract Clauses;
- (c) the Bidder must provide the name of all individuals who will require access to classified or protected information, assets or sensitive work sites;

For additional information on security requirements, Bidders should refer to the [Contract Security Program of Public Works and Government Services Canada](http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/esc-src/introduction-eng.html>) website.

### **1.2 Statement of Work**

The Work to be performed is detailed under Annex A – Statement of Work.

### **1.3 Debriefings**

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.



## PART 2 - BIDDER INSTRUCTIONS

### 2.1 Standard Instructions, Clauses and Conditions

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The [2003](#) (2019-03-04) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

Subsection 3.a) of Section 01, Integrity Provisions - Bid of the Standard Instructions ([2003](#)) incorporated by reference above is deleted in its entirety and replaced with the following:

- a. at the time of submitting an arrangement under the Request for Supply Arrangements (RFSA), the Bidder has already provided a list of names, as requested under the [Ineligibility and Suspension Policy](#). During this procurement process, the Bidder must immediately inform Canada in writing of any changes affecting the list of names

### 2.2 Submission of Bids

Bids must be submitted only to [erin.massey@canada.ca](mailto:erin.massey@canada.ca) by the date, time and place indicated in the bid solicitation.

### 2.3 Former Public Servant

Contracts awarded to former public servants (FPS) in receipt of a pension or of a lump sum payment must bear the closest public scrutiny, and reflect fairness in the spending of public funds. In order to comply with Treasury Board policies and directives on contracts awarded to FPSs, bidders must provide the information required below before contract award. If the answer to the questions and, as applicable the information required have not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to comply with Canada's request and meet the requirement within the prescribed time frame will render the bid non-responsive.

#### Definitions

For the purposes of this clause, "former public servant" is any former member of a department as defined in the [Financial Administration Act](#), R.S., 1985, c. F-11, a former member of the Canadian Armed Forces or a former member of the Royal Canadian Mounted Police. A former public servant may be:

- a. an individual;
- b. an individual who has incorporated;
- c. a partnership made of former public servants; or
- d. a sole proprietorship or entity where the affected individual has a controlling or major interest in the entity.

"lump sum payment period" means the period measured in weeks of salary, for which payment has been made to facilitate the transition to retirement or to other employment as a result of the implementation of various programs to reduce the size of the Public Service. The lump sum payment period does not include the period of severance pay, which is measured in a like manner.

"pension" means a pension or annual allowance paid under the [Public Service Superannuation Act](#) (PSSA), R.S., 1985, c. P-36, and any increases paid pursuant to the [Supplementary Retirement Benefits Act](#), R.S., 1985, c. S-24 as it affects the PSSA. It does not include pensions payable pursuant to the [Canadian Forces Superannuation Act](#), R.S., 1985, c. C-17, the [Defence Services Pension Continuation](#)



Act, 1970, c. D-3, the Royal Canadian Mounted Police Pension Continuation Act, 1970, c. R-10, and the Royal Canadian Mounted Police Superannuation Act, R.S., 1985, c. R-11, the Members of Parliament Retiring Allowances Act, R.S. 1985, c. M-5, and that portion of pension payable to the Canada Pension Plan Act, R.S., 1985, c. C-8.

#### **Former Public Servant in Receipt of a Pension**

As per the above definitions, is the Bidder a FPS in receipt of a pension? **Yes ( ) No ( )**

If so, the Bidder must provide the following information, for all FPSs in receipt of a pension, as applicable:

- a. name of former public servant;
- b. date of termination of employment or retirement from the Public Service.

By providing this information, Bidders agree that the successful Bidder's status, with respect to being a former public servant in receipt of a pension, will be reported on departmental websites as part of the published proactive disclosure reports in accordance with Contracting Policy Notice: 2012-2 and the Guidelines on the Proactive Disclosure of Contracts.

#### **Work Force Adjustment Directive**

Is the Bidder a FPS who received a lump sum payment pursuant to the terms of the Work Force Adjustment Directive? **Yes ( ) No ( )**

If so, the Bidder must provide the following information:

- a. name of former public servant;
- b. conditions of the lump sum payment incentive;
- c. date of termination of employment;
- d. amount of lump sum payment;
- e. rate of pay on which lump sum payment is based;
- f. period of lump sum payment including start date, end date and number of weeks;
- g. number and amount (professional fees) of other contracts subject to the restrictions of a work force adjustment program.

For all contracts awarded during the lump sum payment period, the total amount of fees that may be paid to a FPS who received a lump sum payment is \$5,000, including Applicable Taxes.

#### **2.4 Enquiries - Bid Solicitation**

All enquiries must be submitted in writing to the Contracting Authority no later than five (5) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated, and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

#### **2.5 Applicable Laws**

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.



## **PART 3 - BID PREPARATION INSTRUCTIONS**

### **3.1 Bid Preparation Instructions**

Canada requests that bidders provide their bid in separately bound sections as follows:

- Section I: Technical Bid: One electronic copy by email;
- Section II: Financial Bid: One electronic copy by email;
- Section III: Certifications : One electronic copy by email;

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of their bid:

- a) use a numbering system that corresponds to the bid solicitation.
- b) Emails, including attachments must not be larger than 20mb to not exceed server limitation. If required please submit your bid in separate emails

#### **Section I: Technical Bid**

In their technical bid, Bidders should explain and demonstrate how they propose to meet the requirements and how they will carry out the Work.

#### **Section II: Financial Bid**

Bidders must submit their financial bid in accordance with the Basis of Payment as per Annex B.

#### **Section III: Certifications**

Bidders must submit the certifications and additional information required under Part 5.



**PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION**

**4.1 Evaluation Procedures**

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

**4.1.1 Technical Evaluation**

**4.1.1.1 Mandatory Technical Criteria**

**ATTENTION BIDDERS:**

Write beside each of the criterion the relevant page number(s) from your bid which addresses the requirement identified in the criteria.

<b>Mandatory Technical Criteria</b>		<b>Cross-Reference to bid (<i>indicate page #</i>)</b>
#1	The bidder must demonstrate, by providing supporting documentation, that the proposed investigator is a registered Canadian member in good standing of the American Industrial Hygiene Association. The Bidder must provide a copy of the valid documentation at bid closing.	
#2	The bidder must demonstrate, by providing supporting documentation, that the proposed investigator is a Registered Occupational Hygienist (ROH) or Certified Industrial Hygienist (CIH), or that the proposed investigator work will be oversight and reviewed by a CIH. The Bidder must provide a copy of the valid documentation at bid closing.	
#3	The bidder must demonstrate, by providing a detailed CV, that the proposed investigator has experience in occupational health risks related to workplace noise. The Bidder must provide a detailed summary of 3 projects of similar size and scope within the last five (5) years.	
#4	The Bidder must identify which city they are bidding on: Vancouver (Vancouver International Airport and Port of Vancouver)  Toronto (Toronto Pearson International Airport and Port of Toronto)  Montreal (Pierre Elliott Trudeau International Airport and Port of Montreal)  Halifax (Halifax Stanfield International Airport and Port of Halifax)	



#### **4.2 Basis of Selection**

*SACC Manual* Clause A0031T (2010-08-16), Basis of Selection – Mandatory Technical Criteria

Health Canada requires the services in only one of the named cities. The proposal for the city with the lowest compliant bid will be recommended for contract award.





## **PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION**

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

### **5.1 Certifications Required with the Bid**

Bidders must submit the following duly completed certifications as part of their bid.

#### **5.1.1 Integrity Provisions - Declaration of Convicted Offences**

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the declaration form available on the [Forms for the Integrity Regime](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) website (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>), to be given further consideration in the procurement process.

### **5.2 Certifications Precedent to Contract Award and Additional Information**

The certifications and additional information listed below should be submitted with the bid, but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame provided will render the bid non-responsive.

#### **5.2.1 Integrity Provisions – Required Documentation**

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real property agreement of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

#### **5.2.2 Status and Availability of Resources**

SACC Manual clause [A3005T](#) (2010-08-16), Status and Availability of Resources

#### **5.2.3 Education and Experience**

SACC Manual clause [A3010T](#) (2010-08-16), Education and Experience



## **PART 6 - RESULTING CONTRACT CLAUSES**

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

### **6.1 Security Requirements**

There is no security requirement applicable to the Contract.

1. Unscreened contractors must be escorted by an employee or Commissionaire at all times when visiting Government of Canada facilities.
2. Information which is to be used in the development of the contracted product, as reference material or otherwise made available to the contractor must be unclassified material and considered to be releasable to the public by Health Canada/Public Health Agency of Canada and/or The Government of Canada.
3. No Protected or Classified information is to be made available to the contractor, used in the production of the contracted product, or produced as a result of this contract.

### **6.2 Statement of Work**

The Contractor must perform the Work in accordance with the Statement of Work at Annex A.

### **6.3 Standard Clauses and Conditions**

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

#### **6.3.1 General Conditions**

[2010B](#) (2018-06-21), General Conditions - Professional Services (Medium Complexity) apply to and form part of the Contract.

#### **6.3.2 Supplemental General Conditions**

[4008](#) (2008-12-12), Personal Information, apply to and form part of the Contract.

### **6.4 Term of Contract**

#### **6.4.1 Period of the Contract**

The period of the Contract is from Contract Award to March 31, 2020 inclusive.

#### **6.4.2 Optional Services**

The Contractor grants to Canada the irrevocable option to acquire the services described at Annex A of the Contract under the same conditions and at the prices and/or rates stated in the Contract. The option may only be exercised by the Contracting Authority and will be evidenced, for administrative purposes only, through a contract amendment.

The Contracting Authority may exercise the option at any time before the expiry of the Contract by sending a written notice to the Contractor.



## 6.5 Authorities

### 6.5.1 Contracting Authority

The Contracting Authority for the Contract is:

Name: Erin Massey  
Telephone: 613-941-2094  
E-mail address: [erin.massey@canada.ca](mailto:erin.massey@canada.ca)

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

### 6.5.2 Project Authority (identify at contract award)

The Project Authority for the Contract is:

Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Project Authority, however the Project Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

### 6.5.3 Contractor's Representative (identify at contract award)

Name: \_\_\_\_\_  
Telephone: \_\_\_\_\_  
E-mail address: \_\_\_\_\_

## 6.6 Proactive Disclosure of Contracts with Former Public Servants

By providing information on its status, with respect to being a former public servant in receipt of a [Public Service Superannuation Act](#) (PSSA) pension, the Contractor has agreed that this information will be reported on departmental websites as part of the published proactive disclosure reports, in accordance with [Contracting Policy Notice: 2012-2](#) of the Treasury Board Secretariat of Canada.

## 6.7 Payment

### 6.7.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price of \$ \_\_\_\_\_. Customs duties are excluded and Applicable Taxes are extra.

### 6.7.2 Limitation of Expenditure

1. Canada's total liability to the Contractor under the Contract must not exceed \$ \_\_\_\_\_. Customs duties are excluded and Applicable Taxes are extra.
2. No increase in the total liability of Canada or in the price of the Work resulting from any design changes, modifications or interpretations of the Work, will be authorized or paid to the Contractor unless these design changes, modifications or interpretations have been approved, in writing, by the Contracting Authority before their incorporation into the Work. The Contractor must not perform any work or provide any service that would result in Canada's total liability being exceeded before obtaining the written approval of the Contracting Authority. The Contractor must notify the Contracting Authority in writing as to the adequacy of this sum:
  - a. when it is 75% committed, or



- b. four months before the contract expiry date, or
- c. as soon as the Contractor considers that the contract funds provided are inadequate for the completion of the Work,

whichever comes first.

3. If the notification is for inadequate contract funds, the Contractor must provide to the Contracting Authority a written estimate for the additional funds required. Provision of such information by the Contractor does not increase Canada's liability.

### **6.7.3 Term of Payment – Single Payment**

SACC Manual clause [H1000C](#) (2008-15-12), Single Payment

## **6.8 Invoicing Instructions**

1. The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

Each invoice must be supported by:

- a. a copy of the release document and any other documents as specified in the Contract.
2. Invoices must be distributed as follows:
    - a. One (1) electronic copy must be forwarded to the Project Authority and to [hc.p2p.east.invoices-factures.est.sc@canada.ca](mailto:hc.p2p.east.invoices-factures.est.sc@canada.ca) for certification and payment.

## **6.9 Certifications and Additional Information**

### **6.9.1 Compliance**

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

## **6.10 Applicable Laws**

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Ontario.

## **6.11 Priority of Documents**

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- (a) the Articles of Agreement;
- (b) the supplemental general conditions [4008](#) (2008-12-12), Personal Information;
- (c) the general conditions [2010B](#) (2018-06-21), General Conditions - Professional Services (Medium Complexity);
- (d) Annex A, Statement of Work
- (e) Annex B, Basis of Payment
- (f) the Contractor's bid dated \_\_\_\_\_

## **6.12 Insurance Requirement**

[G1005C](#) (2016-01-28) Insurance – No Specific Requirement



## ANNEX "A" - STATEMENT OF WORK

### Investigation of Workplace Noise Exposure & Risk Assessment & Advice to Mitigate Risks

#### 1. OBJECTIVE

In order to meet its obligations under the Canada Labour Code (CLC) Part II, the Canada Occupational Health and Safety Regulations (COHSR) and the National Joint Council Occupational Safety and Health Directives (NJC-OHS), the Public Health Agency of Canada's Office of Border and Travel Health (OBTH) requires assistance in the investigations of possible exposure or occupational health risk(s) related to workplace noise hazards. The investigation(s) must determine whether or not there exists an occupational health risk to PHAC Environmental Health Officers.

Hygiene services will be required to investigate exposure levels or occupational health risk(s) for Environmental Health Officers and PHAC designated officers (Screening Officers and Quarantine Officers) related to noise at their worksites in **one** of the following locations:

- Vancouver (Vancouver International Airport and Port of Vancouver) or,
- Montreal (Pierre Elliott Trudeau International Airport and Port of Montreal) or,
- Toronto (Toronto Pearson International Airport, Port of Toronto) or,
- Halifax (Halifax Stanfield International Airport, Port of Halifax) .

This will be done by:

- qualitatively assessing occupational health risk(s) related to noise hazards;
- prioritizing areas where or if quantitative exposure assessments are required;
- conducting quantitative exposure assessments;
- advising on control measures (e.g. selection of appropriate personal protection).

#### 1.1 Background

Environmental Health Officers (EHOs) conduct public health inspections on conveyances and in land based establishments which are not owned or operated by the employer. Therefore, it is not always possible to reduce or eliminate noise hazards.

Environmental Health Officers are located in regional offices in Vancouver, Toronto, Montreal, Quebec City, Moncton, Halifax and St. John's. They are regularly required to conduct public health inspections and surveillance at the following worksites: in engine rooms of vessels; onboard aircraft, vessels and trains; at marine ports, airports, train and cargo terminals; and at flight kitchens and food catering facilities. Vessels may be docked at a marine port, anchored at sea or making way. Aircraft and trains may be resting or making way.

Hearing protection devices (HPDs) are currently used to protect these employees from noise exposure.

#### 2. INVESTIGATION/ASSESSMENT PROCEDURE

The contracted industrial/occupational hygiene investigations/assessments will include the following steps:

##### Noise Hazards

- 1) Conduct an initial walkthrough of the site, to obtain the necessary background information required to develop an investigation strategy. The site represents high noise exposure areas. The site includes on-board a vessel (i.e. in engine room), airside at an airport (i.e. outside of an aircraft); and at a marine port facility.
- 2) Carry out an investigation according to the agreed upon strategy, under the direction of a qualified person e.g. professional hygienist (e.g., Registered Occupational Hygienist (ROH) or Certified Industrial Hygienist (CIH)) to identify whether PHAC employees are exposed to workplace noise levels which may pose a potential risk to their health.



- 3) Provide a written report to OBTH containing the investigation findings and related monitoring data, including the interpretation of results using the appropriate references (refer to section 3.0) and recommendations to mitigate risks identified.
- 4) Identify any additional testing which may need to be conducted in order to provide a complete assesment.

### **2.1 Walkthrough and Scoping of Work**

- a) Consult with OBTH to obtain background information, confirm dates and locations for the investigation.
- b) Conduct an on-site visit to obtain the information needed to develop an investigation/assessment strategy. Discuss the feasibility of this preliminary on-site visit with OBTH and seek approval to proceed as agreed upon. An on-site visit may be waived where sufficient information is available to develop an investigation/assessment and sampling strategy.
- c) Observe the process or condition which is to be investigated.
- d) Prepare a written plan complete with any sampling objective(s), methodology and/or monitoring strategies, in accordance with the appropriate references (refer to section 3.0), and according to recognized industry best practices.
- e) Submit a written copy of the investigation/assessment strategies, including timelines, rationale for proposed sampling and analyses methodology, to OBTH for approval prior to commencement of the investigation/assessment.

### **2.2 Investigation/Assessment**

a) The investigation must be done in accordance with the approved investigation/assessment strategies and relevant federal occupational health and safety legislation and standard (listed in Section 3.0) The investigation/assessment shall determine whether or not a health risk exists, and if there is a potential for adverse health effects to OBTH employees under the CLC Part II, COHSR, and NJC-OHS Directives, or other relevant standards or guidelines. The investigation/assessment will be used to identify and prioritize areas where or if quantitative exposure assessments are required.

b) The Project Manager or assigned back-up, shall be notified immediately if, during an investigation/assessment, a condition is found or suspected to exist that would be considered immediately dangerous to the life or health of any person or persons in the workplace.

c) The following measures apply when sampling, monitoring and/or relevant scientific testing is required to determine the potential and/or actual level of employee noise exposure:

- I. All selected sampling equipment must be used, calibrated and maintained in accordance with manufacturer's recommendations, and in accordance with good industrial hygiene practices (e.g. recommendations by the American Industrial Hygiene Association (AIHA)).
- II. Equipment must be accompanied with valid calibration (as per manufacturer's recommendation) certification and supported by effective Quality Control/Quality Assurance protocol.
- III. A representative number of measurements, according to approved or accredited methodologies by recognized authorities, such as the National Institute of Occupational Health & Safety (NIOSH) or AIHA, and following a sound statistical methodology in order to determine potential employee exposure levels.

d) The investigation/assessment shall adhere to all aspects of the *Privacy Act* and *Privacy Regulations*, Treasury Board privacy-policies, directives and standards, and the standard acquisition contract clauses referred to in the contract.

### **2.3 Report**

a) A report shall be prepared by the investigator in the OBTH requested format as provided in Annex C. It should include, at a minimum, the following information:



- I. The sampling objective, methodology, exposure assessment guideline / Occupational Exposure Limit (OEL) field observations (if applicable) discussions, conclusions and recommendations).
- II. Sampling data; laboratory analytical report, complete with statement of accreditation; and data logger results, where applicable.
- III. Where possible, an electronic copy of the report should be provided. Attachments (such as laboratory results, photographs and sketches) can be in a suitable electronic format (such as pdf. or Jpeg). Photographs, results, attachments must not include any information that could reasonably be expected to identify an individual alone or with a combination of elements.

b) Results must be interpreted in compliance with the appropriate references (refer to section 3.0).

c) The report shall indicate, if possible, the root causes of and/or observed factors contributing to the potential exposures identified, or OBTH's occupational health issues. If these causes/factors are outside the scope of the current investigation, the report shall state how such causes/factors may influence the reported results and the conditions found in the workplace.

d) The report shall include information, provided by the client or observed during the investigation, on the work activities and operational conditions that were present during monitoring and how, and/or if, those activities and operations relate to routine or long term worksite conditions.

e) The report shall include recommended options for risk reduction control measures (e.g., where appropriate, if there is a need for a risk mitigation plan).

f) To maintain the confidentiality of personnel and safeguard their personal information, the names of employees who wore monitoring devices must be excluded from the comprehensive investigation report. In their place, another suitable identifier (e.g., job title #) shall be used to reference personal monitoring data. PHAC will inform each of these workers, by way of written information, of the particular coding (e.g., job title #) cited in the final investigation report that relates to their individual exposure(s). The particular coding that links the worker to the personal monitoring data shall only be accessible to those staff who demonstrate a need to know in order to perform their assigned tasks.

### **3. APPLICABLE FEDERAL OCCUPATIONAL HEALTH AND SAFETY LEGISLATION AND STANDARDS**

For workplace noise exposure, the following Federal legislation and standards must be consulted, adhered to and referenced:

- CLC Part II – Regulation Part VII Levels of Sound. Available at: <http://laws-lois.justice.gc.ca/PDF/SOR-86-304.pdf> ;
- National Joint Council Directive Part VII - Noise Control (levels of sound). Available at: <http://www.njc-cnm.gc.ca/directive/d7/v23/s257/en#s257-tc-tm>;
- CSA Standard Z94.2-14 - Hearing protection devices - performance, selection, care and use;
- CAN/CSA-Z107.56-13 (R2018), Measurement of noise exposure, as amended from time to time.

### **4. LIMITATIONS**

The Contractor understands and agrees that the level of services specified in this Statement of Work is only an approximation of the requirements given in good faith. OBTH will be responsible for providing the following:

- a) Access to the worksite(s) needed to carry out the investigation;
- b) All necessary information needed to complete the investigation; and
- c) Instruction to the Contractor regarding any relevant site safety, security, confidentiality and release of information protocols.

### **5. DELIVERABLES**



The Contractor will prepare a plan in accordance with the investigation procedure in section 2.0, the applicable legislation and standards in section 3.0 and according to recognized industry best practices.

From the date on which the contract commences, the Contractor will have six (6) weeks to conduct the investigation in accordance with the investigation procedure in section 2.0

The Contractor will submit a written detailed investigation report according to the terms set out in section 2.3 upon completion of the investigation. The completed report (in the format as provided in Annex C) will be submitted to OBTH within three (3) weeks from the receipt of all sampling/monitoring results and information needed to complete the report.

OBTH must be notified immediately of any delays in the submission of the report.

## **6. ADDITIONAL INFORMATION**

### **6.1 Additional Reference Documents**

The documents below are provided to the bidder either attached or with applicable website available:

- EHO Job Hazard Assessments 2017 (to be provided at contract award);
- Potable Water on Board Trains, Vessels, Aircraft and Buses Regulations: <http://laws-lois.justice.gc.ca/eng/regulations/SOR-2016-43/index.html>
- Quarantine Act: <http://laws-lois.justice.gc.ca/eng/acts/Q-1.1/index.html>
- International Health Regulations- Handbook for inspection of ships: [http://apps.who.int/iris/bitstream/10665/44594/1/9789241548199\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/44594/1/9789241548199_eng.pdf)





## ANNEX "B" - BASIS OF PAYMENT

SERVICES	ALL-INCLUSIVE FIRM PRICE
Walkthrough and Scoping of Work; Investigation/Assessment; Minimum 3 noise tests; Final Report	
<i>The Bidder must submit a price for each site they are bidding on. Only one contract will be issued resulting from this RFP with a singular site identified. Only the site with the lowest compliant bid before tax will be recommended for contract award.</i>	
<b>Vancouver</b>	\$ _____
<b>Toronto</b>	\$ _____
<b>Montreal</b>	\$ _____
<b>Halifax</b>	\$ _____
<b>Estimated Evaluated Price - Subtotal</b> (excluding applicable taxes)	
	\$ _____
<b>Estimated applicable taxes</b>	
Please indicate the taxes that are applicable (%)	
	\$ _____
<b>TOTAL A</b>	
	\$ _____
<b>OPTIONAL SERVICES</b>	
<b>B. ADDITIONAL TEST IF REQUIREMENTS</b>	<b>COST PER ADDITIONAL TEST</b>
If high noise areas & activities are identified as defined by the COHSR & NJC, conduct sound level dosimeter tests each location in question to assess exposure.	\$ _____



**ANNEX “C” – SOUND LEVEL SURVEY & NOISE EXPOSURE ASSESSMENT  
REPORT TEMPLATE**

*REPORT TEMPLATE*

**Sound Level Survey & Noise Exposure  
Assessment**

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DEPARTMENT NAME

**Prepared by:**

**Date:**



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APPENDIX A: Professional Accreditation

APPENDIX B: Example A-Weighted Sound Pressure Levels for Various Workplace Activities

APPENDIX C: Example Daily Noise Dose Calculation

APPENDIX D: Example Graph of SPL vs Time Log

APPENDIX E: Example Noise Dosimetry Results

APPENDIX F: CSA Z 94.2-02 Hearing Protection Devices (reaffirmed 2011, revised 2014) - Table 4 Selection of Hearing Protection Based upon Grade and Noise Exposure dBA

APPENDIX G: Sound Survey – Noise Exposure Assessment Algorithm



*[Note: Instructions are provided in italics with inserts & examples highlighted in green.]*

## PREAMBLE

Sounds are always present in our everyday lives. Sounds can be pleasant, but may become unwanted noise as their intensity (loudness), frequency, and/or pitch increases.

In the workplace, certain equipment or activities may create unwanted noise. If workplace noise has the potential to impact employee health, the employer has a legislative obligation to conduct an investigation (i.e. a sound level survey and noise exposure assessment). This investigation must follow prescribed methodologies and corrective action may be required if workers are exposed to noise levels that are above set standards.

This sample report is designed to help guide federal public service employers through the sound level survey and noise assessment process by:

- Identifying the legislative criteria governing noise investigations;
- Providing guidance on how to collect, characterise and interpret noise data; and
- Indicating when the investigation findings merit corrective action and hearing tests.

## 1.0 LEGISLATIVE REQUIREMENTS

The *[Name of Employers & Locations]* are subject to all the legislative requirements of the Canada Labour Code (CLC), Part II, Canada Occupational Health & Safety Regulation (COHSR), Part VII – Levels of Sound and the National Joint Council’s (NJC) Occupational Health and Safety Directives, Part VII (Noise Control). Therein it stipulates employers are required to conduct sound level surveys during their operation to identify high noise areas & activities as defined by the COHSR & NJC. If these conditions exist then employers must conduct prescribed measurements to assess the amount of exposure employees incur by working in such noisy areas or during the identified activities. The former is conducted with a Sound Pressure Level (SPL) Meter, and the latter using a sound level dosimeter with its related software in accordance with COHSR (CSA or ANSI<sup>1</sup> as referenced), to record and report noise exposures for comparison to the NJC regulated limits.

The NJC Part VII –Noise Control (Levels of Sound) Appendix A, Maximum permitted duration of exposure to A-weighted sound pressure level at workplace, is the standard applied to federal workers exposed to noise in the workplace. It is chosen because it is a more restrictive /protective standard since it does not permit any exposure above 101 dBA whereas the COHSR (Section 7.4) lists exposure time for SPL up to 120 dBA. It also assigns workers exposures ( $L_{ex8}$ ) at 84 dBA as the point when medical surveillance (i.e., audiometry) is required and typically is included in a recommended Hearing Conservation Program.

Links to the above noted documents are found at:

<http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/page-24.html#h-70>, <http://www.njc-cnm.gc.ca/directive/index.php?sid=257&hl=1&lang=eng>

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<sup>1</sup> CSA Canadian Standards Association  
ANSI American National Standards Institute



## 2.0 INTRODUCTION

*[Enter Organizational reference information]*

The **[Name of Investigating Organization]** conducted a Sound Level Survey at the **[Name of Employer, address, street. Location]**. **[Name of Investigator]** carried out the sound level survey on **[Dates]**. The measurements were taken to determine if workers were exposed to potentially harmful levels of noise as a result of the operating conditions at the facility. The sound level readings are considered representative of the working conditions at the time the sound level survey was conducted.

The noise assessment described herein was conducted by a Qualified Person. The COHSR Part I, (1.2) defines a qualified person "In respect of a specified duty, a person who, because of his [or her]<sup>2</sup> knowledge, training and experience, is [licensed or otherwise] qualified to perform that duty safely and properly". The qualified person could be a certified professional or someone who has met a set of standards for competency and proficiency in occupational health and safety and provided references of past clients.

*See Appendix A for more information on Professional Accreditation.*

## 2.1 BACKGROUND INFORMATION

*[Enter site and operating conditions]*

The **[Name of Employer]** facilities on **[St. Location]** include a **[Description of facilities, type and number of equipment/machinery]**. The organization employs **[number of employees & trades, working from \_\_\_ am to \_\_\_ pm \_\_\_ days per week. (e.g., One mechanic normally works on Saturdays from 8:00 am to 4:30 pm. Include a brief description of the facility: space, size, and type of operation from noise exposure perspective. Describe the workforce: number and size of each identified similar exposure workgroup, shift pattern: rotation versus straight hours, 8 hr. versus extended work shift, etc.)]**

Sound level and/or noise exposures in the work area are generated by (XXX) sources:

1. *Include a description of the facility (e.g., made of noise absorbing or reflective material) and the identified noise generating sources/tasks. This information should also be listed under results and observations. (E.g., the use of compressed air hoses, 130 psi compressor, steam jenny, and air-tools (such as: impact guns, oscillators, chop saw, grinder, air-ratchet, and cleaning tool), and*
2. *Indicate if warning signs are or are not posted at the entry to high noise areas.*

## 2.2 PURPOSE OF NOISE EXPOSURE ASSESSMENT

- An area sound level survey is conducted to determine if noise exposure levels within the work areas exceeded accepted noise exposure standards (NJC Part VII (Noise Control) Appendix A).
- *The sound level measurements would then be used to determine if the levels associated with particular machines, or work areas, would require a subsequent noise dosimetry investigation.*
- Personal noise exposure, or dosimetry, as per the NJC is required to determine whether the employees' exposure is within acceptable limits as defined by the legislation, and whether corrective action (i.e., control measures) and medical surveillance (i.e., audiometric testing) is necessary.

### 2.2.1 Area Sound Level Survey

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<sup>2</sup> Expanded definition as per NJC



- The first step in a noise exposure assessment is to identify the levels of sound generated in a workplace where there is a potential for workers to be exposed to high noise. This is accomplished by conducting Sound Pressure Level (SPL) measurements of workplace using an SPL instrument as prescribed in the CLC Part II, COHSR Part VII and recommended in (CSA Z 107.56-M86 (R011) as amended).
- *It is important to record the SPL levels for each of the respective workplace sound generating activities and operations. This will identify areas for further investigation such as sound power level and octave band analyses required for the application of engineering controls, or selection of personal protection.*
- Areas and activities generating a SPL greater than 87 dBA are designated by COHSR as high noise areas/activities. When present it mandates the need for posting the areas with warning signage, the training of workers, and the need for worker exposure measurements to determine if worker hearing is at risk. Refer to the Discussion section for information on the observed work practices related to the wearing of (e.g., ear plugs & muffs) and use of warning signs.



## 2.2.2 Personal Noise Exposure

- The second step in a noise exposure assessment is to conduct personal sound exposure measurements, otherwise known as dosimetry, on personnel while they are working in high noise areas or conducting sound generating activities.
- Noise, or sound level, dosimeters are used for this purpose because they have data logging and averaging capability. This enables the recording of sound levels over a desired period of time and determines, according to mandated formulae, the length of time for an exposure at a certain SPL. Sound dosimeters must also meet the specifications stipulated by the CSA Standard Z107.56-M86 (revised 2013) and therein as stipulated in IEC 61672-1 or ANSI S 1.4, or ANSI S1.25 to demonstrate compliance with COHSR.
- In order to appropriately interpret the dosimeter data, records must be maintained to indicate the time and duration the person being monitored is located in a respective noisy area or conducting sound generating activities.

## 2.3 SCOPE OF NOISE EXPOSURE ASSESSMENT

*[Provide details]*

### 2.3.1 Area Noise Survey Methodology/Procedure

- 1) **Sound Level Meter** (*eg., Quest, B&K, or Larson Davis*)  
Sound level readings were collected under normal operating conditions, including *[insert description of what was tested]: (e.g., diesel engines at idling speed and at various rpm's).*
- 2) **Measurement Settings**  
*[All the following settings must apply to the sound meter used and be reported]*
  - A-weighted sound pressure level
  - Dynamic range of 50 dB & Crest Factor of 30 dB
  - Instantaneous sound level readings
  - Slow response setting
  - Type II microphone tolerance per IEC 61672-1 or ANSI S1.4 as a minimum
  - The SPL meter performance must be verified before and after daily measurements using a Precision Acoustic Calibrator specific for the SPL meter (e.g., Larson Davis Cal 150 Precision Acoustic Calibrator for a Larson Davis SPL meter).
  - Specify the method used to collect area measurements (*e.g., measurements were obtained at 1 meter away from source; and grab readings were taken with the results listed as a range of values; or a standard interval average [30 sec to 60 sec] was used*).
- 3) **Report Results**  
*[Consider including the following when recording & reporting noise assessments]*  
*[The SPLs measured during the various daily activities should be reported to identify when and where high noise may occur. (An example is provided in Appendix B)].*
  - Table YYY (below) itemises the respective SPLs obtained during the various work site sound generating activities. These SPL measurements (can be/were) used to calculate an estimated or projected daily noise exposure. This is only an estimation of personal exposure because the instrument used was not a dosimeter meeting CSA specifications and was not attached to the neck/lapel region of the



person engaged to record the integrated sound at the ear while in sound generating area(s). Nevertheless, this calculated estimate of noise exposure can be used to substantiate the need for dosimetry to confirm the actual noise exposures.

- An **estimated or projected** Daily Noise Dose (DND) can be calculated by taking the sum of the time working in a noisy area, or during a noisy activity, divided by the allowable time of exposure for the respective sound levels as cited in NJC Part VII, Appendix A. If the sum is greater than one then the person working at the measured activity has exceeded the allowable limits and corrective measures are required.

The **estimated or projected** Daily Noise Dose (DND) calculation can be expressed in the following formula.

$$\text{DND} = \sum (C_1 / T_1 + C_2 / T_2 + C_3 / T_3 \dots + C_n / T_n)$$

Where:

$C_i$  is the # of hours exposed to a given SPL

$T_{i-n}$  is the NJC allowable time at the given SPL interval

- The **estimated or projected** Daily noise dose (DND) is provided in Table YYY. *In the example below, the SPL at the individual locations reported for May 4<sup>th</sup> did **not** exceed the maximum allowable SPL (per NJC). However, the **total** calculated exposure for that day is very close to exceeding the allowable daily dose set by the NJC. The May 3<sup>rd</sup> estimated DND exposure **exceeds** the allowable daily dose at each activity and for that day by a sizable amount.*
- The determination of risk to worker health arising from exposure to high noise, as noted in Daily Noise Dose and/or exposure estimates, are based solely on the intensity of sound being measured as if a worker were unprotected (i.e., not wearing any hearing protection). *(E.g., the workers engaged in activities in the high noise area XX were observed wearing YY personal protective equipment (i.e., muffs type ZZ) effectively (or not).*





Table **YYY – Example Area Sound Survey & Estimated Daily Noise Dose (DND)**

Employee # 1		May 3				May 4			
		SPL	Work Time		NJC Allowed Time	SPL	Work Time		NJC Allowed Time
	min		hr.	hr.			min	hr.	hr.
1.	Cleaning, Steam Jenny, & Running Engines	99	120	2.0	0.5	92	60	1.0	2.5
2.	Compressor Station, Oscillator Tool, Chop Saw, & Running Engines	100	60	1.0	0.4	99	15	0.25	0.5
3.	Running Engines	95	15	0.25	1.3	93	10	0.17	2.0
<b>Estimated Daily Noise Dose</b>					<b>6.88</b>				<b>0.985</b>

An example of DND calculations using the above data is shown in Appendix C.

### 2.3.2 Personal Noise Monitoring (i.e., Dosimetry)

[Provide details]

#### 1) Dosimeter (eg., Quest, B&K, or Larson Davis)

- The performance of the dosimeter meter was verified before and after daily measurements using a calibrator specific to the particular manufacturer's specifications (e.g., Larson Davis Cal 150 Precision Acoustic Calibrator or Quest Model CA-12B Sound Calibrator).
- **Position of Dosimeter:** Personnel being monitored had their respective dosimeter attached to clothing in the area nearest the ear (e.g., shirt collar). The period of time the dosimeter was worn was noted and reported in Table xxx along with the duration of a complete work day).
- **Worksite conditions:** Sound level readings were obtained under normal operating conditions, including having the [e.g., give description of what you are testing] (such as diesel engines at idling speed and at various rpm's, and when operating the compressor, steam jenny, chop-saw, and air-tools).

#### 2) Measurement Settings

[Report the measurement criteria and instrument specifications used during the survey to document compliance with COHSR.]

- A-weighted sound pressure level
- Instantaneous sound level readings
- Type II microphone tolerance per IEC 61672-1 or ANSI S1.4, or ANSI S1.25
- Slow response
- Dynamic range of 50 dB & Crest Factor of 30 dB
- Exchange Rate: 3 dB
- Threshold levels  $\geq 74$  dBA
- Evaluation Criterion Level: 87.0 dBA is the maximum permissible exposure for an 8-hour period.
- RMS Threshold level: 102 dBA is according to the NJC, Part VII (Noise Control) Appendix A, the sound level for which no federal worker exposure is permitted.
- Data Analysis of SPL readings was done using the software specific to the dosimeter employed (e.g., Spark & Blaze Personal Noise Dosimeter Analysis Software for a Spark dosimeter). The sound exposures were recorded throughout



the measurement period with notations taken to record when specific activities occurred.

### 3) Report Results

- a) Sound level readings were collected under normal operating conditions, including having the *[e.g., give description of what you are testing] (i.e., diesel engines at idling speed and at various rpm's, and when operating the compressor, steam jenny, chop-saw, and air-tools).*
- b) The average sound exposure (Leq) measured during the respective activities are displayed across the entire measurement period in graph XXX – SPL vs Time (*An example is provided in Appendix D*).
- c) Dosimeters integrate SPL over time and produce readouts in terms of percent of the allowable or regulated value (D). This can also be expressed as a fraction of the daily noise dose (Df). Thus a D of 110% signifies the exposure is 110% of the allowable limit or a Df of 1.10. The equivalent eight hour TWA (TWA eq or L<sub>ex8</sub>) can then be determined from the percent dose according to the formula:

$$\begin{aligned} \text{TWA}_{\text{eq}} &= 87 + 10 \text{ Log } (D/100),^3 \\ &\text{or} \\ \text{TWA}_{\text{eq}} &= 87 + 10 \text{ Log } D_f \end{aligned}$$

- d) It should be noted that the NJC Part VII Appendix A lists the maximum permitted duration of exposure to A-weighted sound pressure at the workplace. The maximum duration of exposure to 87 dBA is 8 hours (i.e., L<sub>ex8</sub>) per employee per 24 hours. These limits are intended to protect workers from noise induced hearing loss

*(An example of Noise Dosimetry Results is provided in Appendix E).*

## 3.0 NOISE - PHYSICAL CHARACTERISTICS & SOURCES

*[Include noise awareness information and the importance of the hierarchy of controls]*

*Noise is a form of energy that travels as an oscillation transmitted along a medium. The speed sound travels is determined by the density & compressibility of the medium such that sound travels faster in steel than in water or air where the oscillations occur as pressure pulses above and below ambient pressure. Characteristics such as frequency and intensity can interfere with the perception of wanted (acceptable) sound and can be physically, biologically and physiologically harmful to workers in the workplace. Noise levels within the workplace are generally more intense and sustained than any noise levels experienced outside the workplace. Early recognition and evaluation of noise sources, combined with the application of control measures and legislative limits for worker exposure are used to ensure employee exposure to high noise levels are controlled / eliminated, or at the very least, reduced to levels as low as reasonably achievable (ALARA) so as not to be a detriment to human health and safety.*

*Specifying the importance of the hierarchy of control measures is recommended. This includes employing hazard elimination via buy quiet program as the most effective approach and preferred choice. This is followed by engineering controls, then the less effective use of PPE and administrative controls.*

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<sup>3</sup> The formula is based on a 3 dB doubling rate and 87 dBA threshold as mandated by the COHSR Part VII, 7.4 and NJC Part VII.



### 3.1 NOISE MEASUREMENT RESULTS & DISCUSSION

#### 3.1.1 Results

*[Provide details]*

Sound level measurements were taken under various operating conditions, which were considered representative of the work tasks performed by employees. The sound level measurements taken at the time of the survey indicate that noise levels in the **[Enter location]** (e.g., service garage)] areas (met or exceeded) 87 dBA. A detailed listing of the noise measurements, locations and operating conditions can be seen in (Table RRR – SPL /Activity vs Time and/or Graph YYY.)

Warning signs indicating high noise areas (i.e., > 87 dBA) and required use of hearing protection (*when in operation*) were evaluated and found to be (*present or not*) in the high noise areas and complied with (*or not*).

#### 3.1.2 Discussion

*[The Discussion should include visual observations of activities/operations & measurement data. Provide comments on the observations (good or bad) with reference to legislative requirements. Recommendations should also be included in the investigation/noise assessment report].*

*An Example discussion is as follows:*

Sound pressure levels in (*locations XXX*) workplace and/or during (*XXX*) activities are considered as high noise areas because they exceeded the COHRS allowable maximum of 87 dBA and thus indicated the need for the posting of hazard warning signs. Furthermore, since the estimated 8 hour average of exposure ( $L_{ex8}$ ) calculated in Table YYY indicated personal exposures may exceed allowable exposure limits, actual personal exposure measurements (i.e., audiometry) were warranted.

The measured **personal 8 hour average ( $L_{ex8}$ )** sound exposures *[met or exceeded or did not exceed]* the **84dBA** action levels in the *[...workshop area(s)]* while employees are working on *[insert area]* (e.g., diesel engines and using the various tools and equipment). These results indicate that a comprehensive hearing conservation program (HCP) is recommended and that according to the NJC Occupational Health & Safety Directive, **hearing testing (i.e., audiometry), [is or is not] required**. The CLC COHSR requires the application of engineering controls to reduce personal exposures to 87dBA or less. If not practicable, the wearing of suitable hearing protective devices to reduce personal exposure to 87 dBA or less is mandatory for those exposed workers.

The NJC has established an  $L_{ex8}$  of 87 (dBA), with a three (3) dBA exchange rate. This exchange rate means that for each three (3) dBA increase in noise (SPL) exposure level the duration of exposure must be reduced by half (50%). For example, a noise exposure level of 90 dBA means a person can only be exposed for up to 4 hours in any consecutive 24 hour period. To comply with the legislative requirements noise exposure must be reduced to a maximum of 87 dBA using either: engineering controls to reduce noise level generated by the source; or reducing the duration of exposure by shortening work shift in high noise areas; or wearing hearing protection to reduce intensity of noise reaching the worker's inner ear.

The algorithm found in Appendix G is provided as a reference to the mandated actions associated with various area sound survey and daily (i.e., 8 hr.) personal noise exposures that are applied to those reported herein.



[The following provides an example of the operational conditions and/or observations that may arise from a sound level assessment.]

- 1) **Hearing Protection:** Earplugs are available for use, however at the time of the sound survey, employees (*were or were not*) wearing XXX type of hearing protection. **[Insert operational comments that may affect exposure and/or worker protection]** (e.g., *Employees indicated that earplugs were not suitable due to the fact that the plugs would be contaminated with grease and oil on the employees' hands. One employee did retrieve a set of earmuffs from his tool kit.*)

**[Include a comment regarding the effectiveness of hearing protection used in the field by a statement regarding compliance with the CSA class of hearing protection required for the range of SPLs identified (as noted in Appendix F for the respective SPL exposures). If a CSA rating is not available the NRR<sup>4</sup> may be considered but must not be taken at face value. It should be de-rated as recommended by OSHA or NIOSH. NIOSH recommends the NRR be de-rated by 25% for circumaural (muffs), or 50% for the slow recovery foam ear plugs, and by 70% for other protection. This value then has 7dB subtracted as a correction factor to account for the difference between the NRR dBC measurements and the A weighting used in worker exposure assessments. Selecting the CSA Class of protection for the  $L_{ex8}$  that exists will ensure the hearing protection selected will afford sufficient attenuation to protect workers].**

- 2) **Enforcement of Hearing Protection:** (*Not all or all workers*) were observed to be wearing hearing protection in (*designated/posted*) high noise areas. Once again hearing protection should be only used as the last line of defence.
- 3) **Training:** It was reported that (*e.g., some or all*) employees (*had or not*) received training or education in the hazards of excessive exposure to noise, along with the selection, correct use and maintenance of hearing protection.
- 4) **Warning Signs:** Warning signs (*were or were not*) posted in the high noise areas (i.e., locations with > 87 dBA) **[Insert location information]** (e.g., *service garage or at the entrance to the service garage*) to warn workers of the presence of high noise levels within the (XXX) location and mandatory use of (XXX) hearing protection.

#### 4.0 CONCLUSION

[Enter concluding remarks based on the aforementioned discussion points]

Personnel entering and/or working in (*the service garage*) at [*Name of Employer/Facility*] were exposed to noise levels (*in excess of, or within*) the maximum allowable duration for exposure to sound pressure levels as set out in NJC (*and/or*) an eight hour average sound pressure level  $L_{ex 8}$  87 (dBA). Significant aspects of the departmental OH&S Hearing Conservation Policy (*have or have not*) been implemented to protect workers from hearing loss.

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<sup>4</sup> Noise Reduction Rating (NRR) is a guideline indicating the potential decibel hearing protection based on laboratory (not actual in-workplace) test data and therefore should be corrected to apply to real world applications.



Based on the working conditions measured at the time of the sound level survey, it is concluded that personnel entering or working in the *(e.g., service garage are per Table YYY May 3 data or are not per May 4)* are at risk of hearing loss and as such should be included in a comprehensive Hearing Conservation Program.

## 5.0 RECOMMENDATIONS/REQUIREMENTS

*[Provide recommendations within the context of the respective sections found within the COHSR]*

*For Example:*

1. Section 7.5: Insofar as reasonably practicable, every employer shall, by engineering controls or other physical means other than hearing protectors, reduce the exposure to sound of employees to a level that does not exceed the limits prescribed by section 7.4; This may take the form of less noisy equipment or isolation of tasks in order not to expose all employees to the ambient noise. If not practicable.
2. Section 7.7(3): The employer shall ensure every employee entering or working in the *(e.g., service garage)* must wear hearing protection. This includes *(e.g., the Main Shop areas and the entrance(s) to the Main Shop)*. Hearing protectors must meet the requirements set out in CSA Standard Z94.2-02, *Hearing Protectors*, as amended.  
Please note that dual hearing protection (ear muffs and plugs) are recommended when the 8-hour time weighted average exposure exceeds 105 dBA (per CSA Z94.2-02). The wearing of dual protection also applies when the predominant frequency of high-intensity noise is at or below 500 Hz (i.e., low pitch sound). This is because low frequency sound requires more mass than higher frequency sound to attenuate/reduce the sound to acceptable levels.
3. Section 7.7(2): The employer shall (a) in consultation with the work place committee or the health and safety representative, formulate a program to train the employee in the selection, fit, care and use of the hearing protector; and (b) implement the program. This usually involves a comprehensive Hearing Conservation Program including medical surveillance to track any degradation in workers' ability to hear pure tone sounds (e.g., 500-8,000 Hz) and the spoken word to address workplace safety communication issues.
4. Section 7.8 (1): At every work place where an employee may be exposed to an A-weighted sound pressure level greater than 87 dBA, the employer shall, at conspicuous locations within the work place, post and keep posted signs warning of a potentially hazardous level of sound in the work place.

## 6.0 CREDENTIALS

*[Provide the credentials of persons conducting the measurements & who compiled and reviewed the report]*



## APPENDIX A: PROFESSIONAL ACCREDITATION

The following are examples of available professional certifications:

In Canada, the Canadian Registration Board of Occupational Hygienists sets standards of professional competence for occupational health professionals and assesses their proficiency. Additionally, the American Board of Industrial Hygiene also provides an internationally recognized certification for Canadian based professional hygienists.

*Please note that links to Web sites not under the control of the Government of Canada are provided for information only. The government is not responsible for the accuracy, currency or the reliability of the content. The government does not offer any guarantee in that regard and is not responsible for the information found through these links, nor does it endorse the sites and their content.*

### 1) Canadian Registration Board of Occupational Hygienists (CRBOH) (<http://www.crboh.ca>)

The CRBOH is a national, not-for-profit organization which sets standards of professional competence for occupational hygienists and occupational hygiene technologists in Canada. Registration with the CRBOH confers the right to use the title Registered Occupational Hygienist (ROH) or Registered Occupational Hygiene Technologist (ROHT), and indicates the attainment and maintenance of a high standard of professionalism, recognizable in all Canadian jurisdictions.

A list of consultants can be searched at <http://www.crboh.ca/page.cfm?onumber=175>

### 2) American Board of Industrial Hygiene (ABIH) (<http://www.abih.org>)

Accredited by the Council of Engineering and Scientific Specialty Boards, the American Board of Industrial Hygiene has provided the standard of excellence in certification for the industrial hygiene profession since 1960. The designation of certified industrial hygienist (CIH) by this organization is accorded based on specialized education and experience. The CIH is recognised worldwide for its attainment and maintenance of excellence in the profession.

The list of CIH consultants can be searched at <http://www.aiha.org/about-ih/Pages/Find-an-Industrial-Hygienist.aspx>

Note: It is recommended that consultants provide references from past clients.



**APPENDIX B: Example Table of A-Weighted Sound Pressure Levels for Various Workplace Activities**

<b>Sound Level Location / Condition</b>	<b>Instantaneous Sound Level Measurement (dBA)</b>
<b>Equipment &amp;/or Condition</b> <i>e.g., 500 Hp Freightliner Classic Diesel truck</i>	
<i>Idling Speed</i>	<i>86</i>
<i>1000 RPM's</i>	<i>90</i>
<i>1500 RPM's</i>	<i>95</i>
<i>1600 RPM's</i>	<i>95</i>
<i>1700 RPM's</i>	<i>96</i>
<i>1800 RPM's</i>	<i>97</i>
<i>1900 RPM's</i>	<i>98</i>
<i>2000 RPM's</i>	<i>99</i>
<i>2100 RPM's</i>	<i>99</i>
<i>Engine Brake Applied</i>	<i>94</i>
<b>Sound Level Location / Condition</b>	<b>Instantaneous Sound Level Measurement (dBA)</b>
<b>Power Tools &amp; Equipment</b>	
<i>130 PSI Compressor (Bleeding Off Steam)</i>	<i>99</i>
<i>130 PSI Compressor (running)</i>	<i>86</i>
<i>Steam Jenny</i>	<i>80</i>
<i>Ingersol Rand Impact Air Gun - Running</i>	<i>100</i>
<i>Ingersol Rand Impact Air Gun – Putting on Lug-nuts</i>	<i>105</i>
<i>Mac Impact Air Gun - Running</i>	<i>112</i>
<i>Mac Impact Air Gun – Putting on Lug-nuts</i>	<i>108</i>
<i>3/8 Impact Air Gun – Putting on Lug-nuts</i>	<i>108</i>
<i>Cleaning Tool</i>	<i>103</i>
<i>Air Ratchet Tool</i>	<i>102</i>
<i>Oscillator Tool - Running</i>	<i>95</i>
<i>Oscillator Tool –Working on Metal</i>	<i>100-102</i>
<i>Chop Saw</i>	<i>103-104</i>



### APPENDIX C: *Example* Daily Noise Dose Calculation

The Daily Noise Dose calculation can be expressed in the following formula where:

$$DND = \sum (C_1 / T_1 + C_2 / T_2 + C_3 / T_3 \dots + C_n / T_n)$$

Where:

$C_i$  is the # of hours exposed to a given SPL

$T_1$  is the NJC allowable time at the given SPL interval

**Table YYY: Example Calculation for May 3.**

<b>Activity</b>	<b>Time worked(# Hr.)</b>	<b>NJC Allowable Time</b>
1	$C_1 = 2.0$	$T_1 = 0.5$
2	$C_2 = 1.0$	$T_2 = 0.4$
3	$C_3 = 0.5$	$T_3 = 1.3$

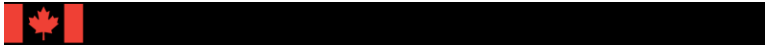
**Example:**

$$DND \text{ for May 3} = \sum (2/0.5 + 1/0.4 + 0.5/1.3) = 4 + 2.5 + 0.38$$

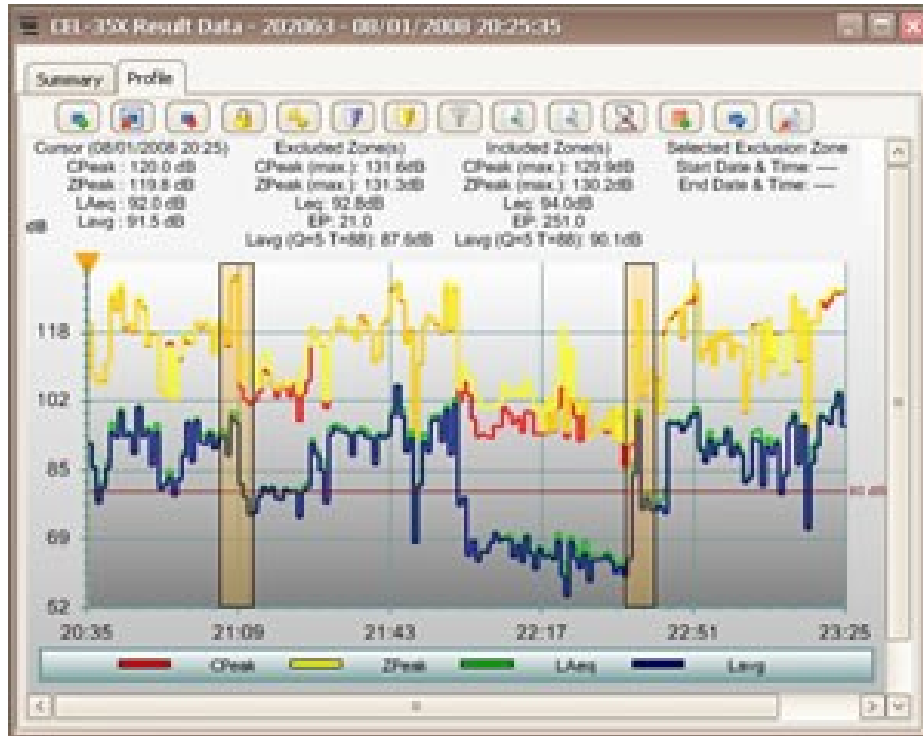
$$DND \text{ for May 3} = 6.88$$

*Interpretation:* Since DND is > 1.0 it exceeds the NJC allowable daily noise exposure limit for a worker per 24 hour period.





## APPENDIX D: *Example* Graph of SPL vs Time Log





**APPENDIX E: Example Noise Dosimetry Results**

<b>NOISE DOSIMETRY RESULTS (dBA) Part VII Maximum Level L<sub>ex8</sub> (87 dBA)</b>				
<b>Employee ID.</b>	<b>EMPLOYEE LOCATION / ACTIVITY</b>	<b>DATE</b>		
		<b>May 3</b>	<b>May 4</b>	<b>May 5</b>
<i>A</i>	<i>Cleaning, Steam Jenny, &amp; Running Engines</i>	<i>102</i>	<i>103</i>	<i>88</i>
<i>B</i>	<i>Compressor Station, Oscillator Tool, Chop Saw, &amp; Running Engines</i>	<i>104</i>	<i>99</i>	<i>97</i>
<i>C</i>	<i>Air Ratchet Tools, Impact Air Guns, &amp; Running Engines</i>	<i>108</i>	<i>105</i>	<i>97</i>



**APPENDIX F: CSA Z 94.2-02 Hearing Protection Devices  
(Reaffirmed 2011, Revised 2014)**

**Table 4:** Selection of Hearing Protection Devices Based upon Grade and Noise Exposure in dBA, Presuming a Desired Effective Exposure when the Hearing Protection Devices Are Worn of  $L_{ex,8} = 85$  dBA

(See clauses 9.5.1, 9.6.4, 9.8.4.2, and 11.2.1 and Appendix A.)

$L_{ex,8}$	Recommended	
	Grade	Class
$\leq 90$	1	C
$\leq 95$	2	B
$\leq 100$	3	A
$\leq 105$	4	A
$> 105$	Dual*	
$> 105$	Dual †	

**\*Dual hearing protection required.** Use minimum of Grade 2 or Class B earmuff and a Grade 3 or Class A earplug.

† Dual hearing protection required. Also, it is recommended that exposure durations be limited, octave band analysis be conducted for attenuation predictors, and twice-annual audiometry be provided to the affected individuals.

**Note:** Inclusion of both classifications schemes in this table is not intended to imply any equivalency. Test methods and grade/class assignments are different and no direct comparison between the two schemes should be made.

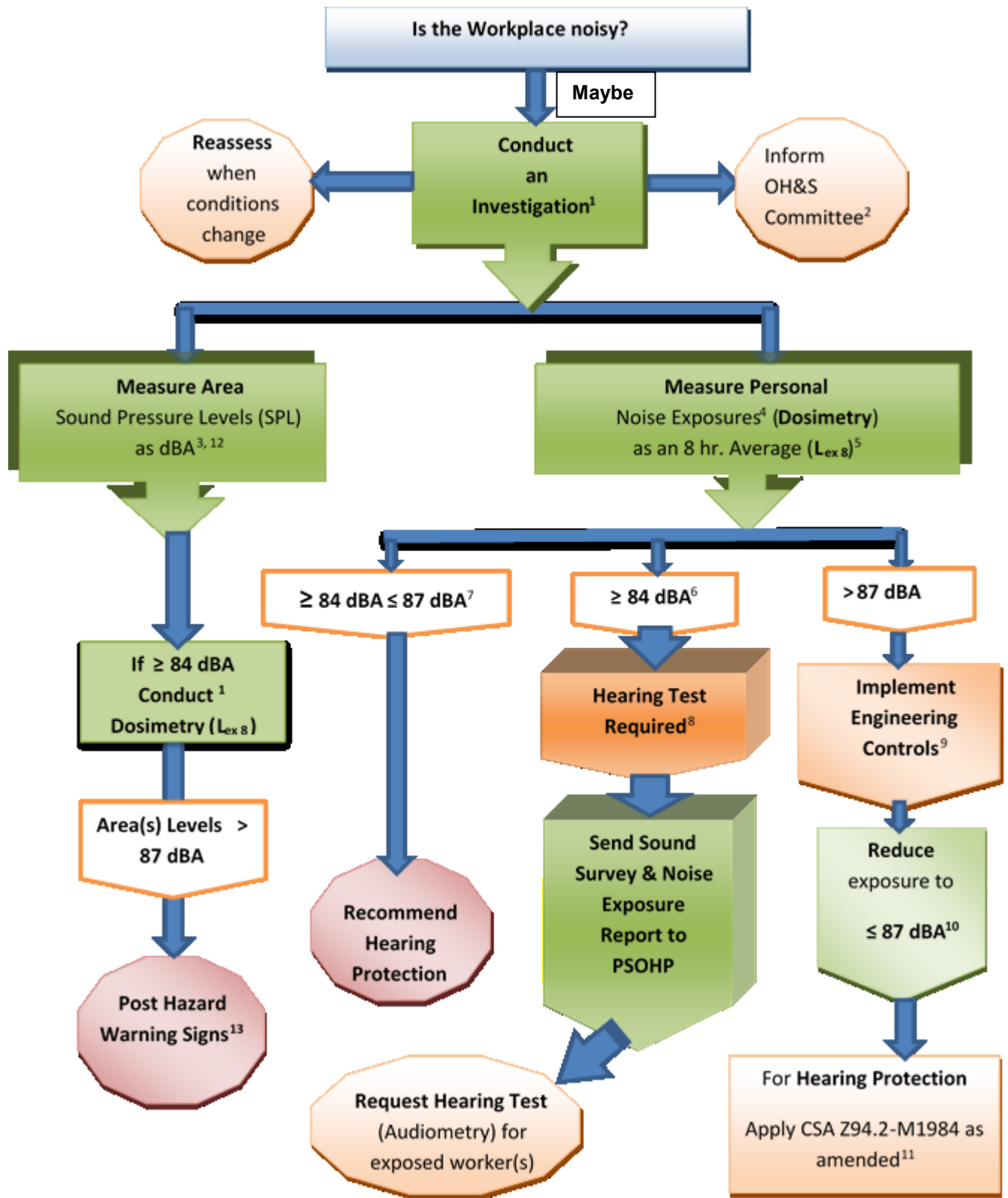
Note:

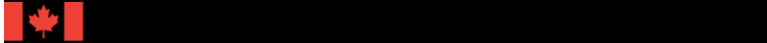
The above hearing protection classification is based on an eight hour exposure at 85 dBA not the 87 dBA regulated in the COHSR & NJC. As such it is more protective.

Details on the attenuation provided by the three classes ( A, B, and C) at frequencies from 125 Hz to 8,000 Hz refer to Table 3 – Sound Attenuation Requirements for Hearing Protectors – and data obtained from an octave band analyses of the workplace sound generating activities/sources.



### APPENDIX G: Sound Survey – Noise Exposure Assessment Algorithm





1. Canadian Occupational Health & Safety Regulation (COHSR) SOR/86-304, Section 7.3 (1)(a), & (4)(e).
2. COHSR, Section 7.3 (1)(b)
3. COHSR, Section 7.1 (Definitions: SPL)
4. COHSR, Section 7.2 (2) and 7.2(3)
5. COHSR, Section 7.1 (Definitions: Noise Exposure Level ( $L_{ex 8}$ ))
6. COHSR, Section 7.3 (4)(e)
7. COHSR, Section 7.3 (5)(c)
8. National Joint Council (NJC) Part VII, Section 7.2
9. COHSR, Section 7.5
10. COHSR, Section 7.4(b)
11. COHSR, Section 7.7(1)(a)
12. COHSR, Section 7.8(2)
13. COHSR, Section 7.8(1)

Below are examples of decisions made using the Sound Survey - Noise Exposure Algorithm.

Type of Recent Noise Measurement	dBA	Related Action
Area Sound Level (SPL)	89	<ol style="list-style-type: none"> <li>1. <b>Post</b> Hazard Warning Signs.</li> <li>2. <b>Conduct</b> Personal Exposure Measurements (Dosimetry).</li> </ol>
	85	<b>Recommend</b> Personal Exposure Measurements (Dosimetry) be conducted to confirm $L_{ex 8}$ is less than 84 dBA.
Personal Noise Exposure ( $L_{ex 8}$ )	79	<b>Reassess</b> when noise sources and/or activities change.
	85	<ol style="list-style-type: none"> <li>1. <b>Hearing protection</b> recommended.</li> <li>2. <b>Hearing test required.</b></li> <li>3. <b>Send</b> Sound survey &amp; Noise exposure assessment / dosimetry report to PSOHP.</li> <li>4. <b>Request</b> Hearing test (i.e., Audiometry).</li> </ol>
	89	<ol style="list-style-type: none"> <li>1. <b>Implement Engineering Controls.</b></li> <li>2. <b>Reduce</b> <math>L_{ex 8}</math> to <math>\leq 87</math> dBA, then</li> <li>3. <b>CSA Z 94.2 Hearing Protection required</b> where <math>L_{ex 8} &gt; 87</math> dBA.</li> <li>4. <b>Hearing test</b> (i.e., Audiogram) <b>required if</b> <math>L_{ex 8} \geq 84</math> dBA</li> <li>5. <b>Send</b> Sound survey &amp; Noise exposure assessment / dosimetry report to PSOHP.</li> <li>6. <b>Request</b> Hearing Test (i.e., Audiometry).</li> </ol>