Local Exhaust Ventilation System Assessment Report

CRM Number No: (CRM Number)

On behalf of

(Client)

At

(Site Name)

(System Details)

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Section 1: Preface

Customer:	(Client)
Site Address:	(Site Address)
Hydro-X Account Manager:	(Account Manager)
Account Manager Telephone Number:	
Account Manager Email Address:	Account Manager Email
Hydro-X Address:	Hydro-X Air Ltd, The Maylands Building Maylands Avenue Hemel Hempstead HP2 7TG
Hydro-X Telephone Number:	01909 565133
Hydro-X Email Address:	info@hydro-x.co.uk
Hydro-X Operatives Carrying Out Works:	(Site personnel name)
Date of Assessment:	(Date)

Any further information concerning this assessment should be requested by contacting the above-named Hydro-X Account Manager.

Section 2: Introduction

The following report relates to the local exhaust ventilation systems assessment carried out at (Site). The survey was conducted by (Engineer) on (Date).

The objective of the survey was to fully inspect and test all LEV systems within the building and to confirm that they comply with current guidelines and are fit for purpose.

Section 3: Legislation, Standards & Guidelines

The Control of Substances Hazardous to Health Regulations 1989 (COSHH), regulation 7, requires that exposure of employees to substances hazardous to health be either prevented or, where that is not reasonably practicable, adequately controlled.

LEV is commonly used to control the release of hazardous airborne substances from a process into the workplace environment. The objective of an LEV is the control the emission as close as possible to the point of release. To be effective, LEV must be well designed and constructed, properly used and maintained in good condition.

Regulation 9 states that:

- It should be maintained in an efficient state, working order and in good repair.
- It should be examined and tested at least once every 14 months (more frequently if appears in Schedule 4).
- A suitable record of the examination and test is kept for at least 5 years.

The ultimate function of the maintenance , examination and testing of LEV plant is to ensure that it operates as originally intended and to effectively capture and dispose of hazardous airborne substances. This should form an integrated program comprising of the following stages:

An initial appraisal of the LEV plant to determine whether it effectively captures and disposes of the emissions and whether it meets the designed specification and performance.

Regular maintenance, including weekly visual checks and routine replacement of components known to have a limited life including filters.

Thorough examination and testing. It should be noted that for the effective examination and testing to take place it is helpful to have available comprehensive information on the system and its design specification, i.e., the information should have been provided when the LEV system was commissioned.

Section 4: Summary of Findings & Recommendations

Using a pitot tube, micromanometer and other ventilation testing equipment each system has been tested where applicable and suitable access permitted for the following parameters:-

1. Smoke capture
2. Face velocity
3. Duct dimensions
4. Air mover/extract fan details

In addition to the above parameters, observations of system condition and performance were made. Where appropriate, recommendations on how to improve system performance have been made.

The results of examination and testing of the local exhaust ventilation systems (LEV) are given in Appendix 1. The results obtained are compared with recommended limits for capture velocities and duct velocities stated in HS (G) 258 – Controlling Airborne Contaminants at Work, listed below:

The conclusions and recommendations should be noted, and appropriate action taken, as necessary.

Airborne Contaminants

Table 1: Some properties of airborne contaminants

Name	Description & Size	Size	Visibility (In normal light)	Examples
Dust	Solid Particles – Can be supplied e.g., Powder-handling, or process generated e.g., crushing, and grinding	Inhalable particle size 0.01µm to 100µm Respirable particle size below 10 µm	Inhalable dust clouds are partially visible Respirable dust clouds are practically invisible at concentrations up to tens of mg/m^3	Grain dust, wood dust, silica flour
Fume	Vaporized solid that has condensed	Particle size 0.001µm to 1µm	Fume clouds tend to be dense. They are partially visible. Fume and smoke are generally more visible than equivalent concentrations of dust	Rubber fume, solder fume, welding fume
Mist	Liquid Particles – Process generated e.g., by spraying	Particle sizes ranges 0.01µm to 100µm but the size distribution may change as volatile liquids evaporate	As for dust	Electroplating, paint sprays, steam
Fibres	Solid particles – The length is several times the diameter	As for dust	As for dust	Asbestos, glass fibre
Vapour	The gaseous phase of a substance which is normally a liquid or solid at room temperature	Behaves as gas	Usually invisible - At very high concentrations, a vapour-laden cloud may just be visible	Styrene, petrol, acetone, mercury, iodine
Gas	A gas at room temperature		Usually Invisible – Some colour at high concentrations	Chlorine, carbon monoxide

Table 9: Capture Velocities

Contaminant Cloud Release	Example of Process	Capture Velocity Range (m/s)
Into still air with little or no energy	Evaporation, mist from electroplating tanks	0.25 to 0.5
Into fairly still air with low energy	Welding, soldering, liquid transfer	0.5 to 1.0
Into moving air with moderate energy	Crushing, spraying	1.0 to 2.5
Into turbulent air with high energy*	Cutting, abrasive blasting, grinding	2.5 to >10
**These types of cloud are difficult to control using capture hoods.*		

Table 12: Recommended minimum duct velocities

Type of Contaminant	Indicative Duct Velocity (m/s)
Gases and non-condensing vapours	5
Condensing vapours, fumes, and smoke	10
Low or medium density, low moisture content dust (Plastic dust, sawdust), fine dusts and mists	15
Process dust (Cement dust, brick dust, wood shavings, grinding dust)	Around 20
Large particles, aggregating and damp dusts (Metal turnings, moist cement dust, compost)	Around 25

Section 5: Methodology:

All inspections to the LEV systems were undertaken in accordance with current Health & Safety Executive guidance HSG 258 and HSG 54.The inspection was undertaken by a competent person who has achieved the BOHS P601 qualification.

The system was inspected visually to assess the general condition, cleanliness, and suitability of the LEV system. The surrounding area was also inspected to check that the LEV was containing the work process from contaminating the surrounding environment.

Operational measurements of the system performance were taken via the use of calibrated devices to ascertain the systems capability to control the contaminants produced from the work process.

Devices used:

- Digital Vane
- Anemometer
- Digital Manometer and Pitot Tube
- Digital Hot Wire

Visual assessments were also undertaken to assess the capture efficiency of the system. Visual assessments were undertaken via the use of smoke tubes and also the use of Tyndall beam checks.

All checks were undertaken in accordance with the client's own in-house health & safety procedures and wearing the provided PPE and RPE provided for the system operator.

PPE & RPE required:

- Safety glasses
- Safety Boots
- Gloves

All staff undertaking the report also hold the following qualifications:

- CSCS Skills Card
- Asbestos Awareness
- Confined Space Training
- General Workplace Health & Safety Certificate

All site notes were recorded at the time of inspection.

Manufacturer's and supplier's information relating to the system that was inspected were requested in advance of the inspections. No records relating to the system were retained by the client and could be supplied prior to the inspection

Section 6: Instruments Information:

INSTRUMENT	MODEL	SERIAL NUMBER
Manometer	DPM ST650 M	568
Hot Wire Anemometer	RS Pro	17050/214
Rotating Vane Anemometer	Testo 420	38453245/604
Smoke Generator	Drager smoke tubes	N/A
Photometer	Not Used	N/A
Aerosol Generator	Not Used	N/A

Test calibration certificates are available on request.

Section 7: Executive Summary

Below is a list of the LEV systems inspected and the resulting assessment of level of control:

Results are based on guidance from HSE (HSG258) as no design specifications were supplied.

Overall Cleanliness:

(Overall cleanliness)

Smoke testing:

Where smoke testing has been used to verify airflow, it has been kept in mind that smoke capture is not necessarily truly indicative of dust capture.

Filter condition:

(Filter Condition)

Airflow Monitors:

(Airflow Monitors)

Particles:

Dusts vary for different materials with respect of the energy required to cause them to become airborne and their ability to remain airborne. Materials in use at the time of inspection may well not have been the worst case. This should be reviewed if it is considered that variation is significant.

A particle count was taken at the time of the LEV tests to see how adequate the system is, as well as a test for the levels of formaldehyde and total organic compounds in the air.

Section 8: Assessment:

LEV Summary			
Site:	(Site Name)	**System Ref:**	(System Details)
Location:	(Location)	**Date:**	(Date)

System Description	
(System description)	

System Performance	Pass	Fail	N/A	Comments
System fully contains contaminants	☐	☐	☐	
Smoke containment test	☐	☐	☐	
Adequate hood face velocities	☐	☐	☐	
Adequate duct transport velocities	☐	☐	☐	
Hood capture zones	☐	☐	☐	

System Design	Yes	No	Comments
Original design specifications	☐	☐	
Results based on HSG 258	☐	☐	
COSHH Assessment	☐	☐	
LEV Logbook	☐	☐	
Operator Instructions	☐	☐	

System Design	Yes	No	Some	N/A	Comments
Hood air flow indication	☐	☐	☐	☐	
Differential pressure gauge at filter	☐	☐	☐	☐	
System Controls Accessible	☐	☐	☐	☐	

System Condition	Pass	Fail	N/A	Comments
Hoods	☐	☐	☐	
Ductwork	☐	☐	☐	
Flexible ducts	☐	☐	☐	
Manual Dampers	☐	☐	☐	
Automatic Dampers	☐	☐	☐	
Fan	☐	☐	☐	
DCE	☐	☐	☐	
Filters	☐	☐	☐	
Test Points	☐	☐	☐	
Discharge ductwork	☐	☐	☐	

Report on Thorough Examination & Test			
Client	(Client)	**System Ref:**	(System Details)
Address	(Site Address)	**Test Date:**	(Date)
		Location:	(Location)
		Process:	(Process)
Hazard to be Controlled:		**Restrictions:**	
Date & Report of Previous Examination		**Interval Between Routine Examinations**	
(Date)		(Interval)	

Assessment of Level of Control: (Assessment)

Particle Count		
Particle Size	**Reading (mg/m^3)**	**Specifications / Air Quality**
PM 2.5	(Reading)	(Control)
PM 1.0	(Reading)	(Control)
PM 10.0	(Reading)	(Control)
Formaldehyde	(Reading)	(Control)
Total Volatile Organic Compound	(Reading)	(Control)
Relative Humidity	(Reading)	(Control)
Temperature	(Reading)	(Control)

LEV Reference	Location	Date of Test	Next Test Due	Pass / Fail	Actions / Recommendations / Remedials	
LEV 1	(Location)	(Date)	(Date + 14 Months)	(Pass/Fail)	(Action 1)	(Description 1)
					(Action 2)	(Description 2)
					(Action 3)	(Description 3)
					(Action 4)	(Description 4)
					(Action 5)	(Description 5)
					(Action 6)	(Description 6)
					(Action 7)	(Description 7)

Action Required		Person Responsible	Target Date	Date Completed
(Action 1)	(Description 1)			
(Action 2)	(Description 2)			
(Action 3)	(Description 3)			
(Action 4)	(Description 4)			
(Action 5)	(Description 5)			
(Action 6)	(Description 6)			
(Action 7)	(Description 7)			

Hoods / Enclosures	
Hood(s) Description:	**Visual Examination Report:**
(Number of Hoods)	(Visual Condition)

Hood I.D.	Hood Open Area (m^2)	Sash Height	Face Velocity		Capture Distance		VCD Setting	Volumetric Flow Rate m^3/h
			Actual (m/s)	Min (m/s)	Actual (m/s)	Min (m/s)		
Hood 1	0.0108		9.80	1.00			50	
Hood 2								
Hood 3								
Hood 4								
Hood 5								
Hood 6								

Hood I.D.	Hood Open Area (m^2)	Sash Height	Face Velocity		Capture Distance		VCD Setting	Volumetric Flow Rate m^3/h
			Actual (m/s)	Min (m/s)	Actual (m/s)	Min (m/s)		
System Total Volume								m^3/h

Statistics			
Date of Installation:		Process Conditions:	
Total Number of Hoods:		Static Pressure Gauges:	
Max No. to be Used:		Pass/Fail Stickers:	

Ductwork			
Type:		**Biometric Pressure:**	
Air Temperature:		**Stack Height:**	
Visual Examination Report:			

Test Point I.D. / Location	Diameter / Dimensions (mm)	Duct Area (m^2)	Static Pressure	Duct Velocity		VCD Setting	Duct Volumetric Flow Rate m^3/h
				Actual (m/s)	Min (m/s)		
TP1	220	0.03802	-3018	12.1	15	50%	1656.07
TP2							
TP3							
TP4							
TP5							
TP6							

Test Point I.D. / Location	Diameter / Dimensions (mm)	Duct Area (m^2)	Static Pressure	Duct Velocity		VCD Setting	Duct Volumetric Flow Rate m^3/h
				Actual (m/s)	Min (m/s)		

Fan Motor Details		Filter / Air Cleaning Details	
Type:		Unit Type:	
Manufacturer:		Manufacturer:	
Model:		Model:	
Serial Number:		Media:	
Drive Type:		Pressure Drop:	
Motor Power:		Monitor Gauge:	
Fan Speed		Condition:	
Designated Volume Flow (m^3/h):		Cleaning system:	
Rotation:		Recirculation:	

Section 9: Schematic Drawing