ATSDR Newsletter for Health Assessors

Including APPLETREE Partners

Guidance & Clearance News

December 2023

Welcome!

This newsletter keeps you informed about guidance and resources that you can use in your health evaluations.

What is in this Newsletter?

This edition of the *ATSDR Newsletter for Health Assessors* includes the following topics:

The Public Health Assessment Guidance Manual (PHAGM) resources page now contains an index of all topics covered in previous newsletters, under the heading of ADS Newsletters: Topics Related to Various PHAGM Sections.

Tox Profile Update: Be Sure to Update Your Public Health Documents with New MRLs

(Note: Updated and finalized toxicological profiles are released regularly. Later articles will cover profiles released since April 2023.)

In January 2023, ATSDR released four toxicological profiles for public comment:

- 1,1,1-trichloroethane (71-55-6)
- cobalt (7440-48-4)
- vinyl chloride (75-01-4)
- alpha, beta, and gamma hexachlorocyclohexane (HCH) (319-84-6, 319-85-7, 58-89-9)

The minimal risk levels (MRLs) from these profiles are provisional because the documents are out for public comment. You can use them to evaluate exposures in your public health documents, and they should replace the previous MRL, if different. When referring to MRLs that are out for public comment in your document, use the phrase "provisional MRLs."

In April 2023, ATSDR released three final toxicological profiles:

- chlorodibenzofurans (57117-44-9, 57117-41-6, 57117-31-4)
- 2-, 3-, and 4-nitrophenol (88-75-5, 554-84-7, 100-02-7)
- n-nitrosodimethylamine (62-75-9)

The MRLs from these profiles are final—use them in your public health documents.

It's easy to identify new toxicological profiles by checking ATSDR's [toxicological profiles](#) website. To sign up for email updates, submit your email address at the bottom right of the website page.

If you're working on a public health document that involves these chemicals, review your screening process. Lower MRLs will lower the Environmental Media Evaluation Guide (EMEG) that screens your data for noncancer endpoints (1,1,1-trichloroethane, vinyl chloride, alpha-HCH, gamma-HCH). Two new MRLs were released for the first time, so you should screen your data against these new EMEGs (cobalt, alpha-HCH). Several of the MRLs for certain furans changed or were not previously in PHAST. Sometimes, a new MRL will be higher than the older MRL. This is the case for one of the MRLs for beta-HCH. See Table 1 for details.

You might have selected these chemicals as a potential contaminant of concern (COC) and the MRL changed. So you'll also need to update your toxicological evaluation, list the new MRL, and evaluate whether harmful effects are possible.

Table 1. Summary of the provisional and final MRLs released in January and April 2023 compared to their previous MRL

Chemical	Route, Duration	Current MRL	Previous MRL	Current MRL Is Different
1,1,1-trichloroethane	Inhalation, acute	1 ppm	2 ppm	*Yes*
1,1,1-trichloroethane	Inhalation, intermediate	0.7 ppm	0.7 ppm	No
1,1,1-trichloroethane	Oral, intermediate	2,000 µg/kg/day	20,000 µg/kg/day	*Yes*
Cobalt	Inhalation, chronic	0.1 µg/m^3	No value in PHAST	*Yes*
Cobalt	Oral, acute	30 µg/kg/day	No value in PHAST	*New*
Cobalt	Oral, intermediate	30 µg/kg/day	10 µg/kg/day	No
Vinyl chloride	Inhalation, acute	0.5 ppm	0.5 ppm	No
Vinyl chloride	Inhalation, intermediate	0.02 ppm	0.03 ppm	*Yes*

Chemical	Route, Duration	Current MRL	Previous MRL	Current MRL Is Different
Vinyl chloride	Oral, chronic	3 µg/kg/day	3 µg/kg/day	No
alpha-HCH	Oral, intermediate	2 µg/kg/day	No value	*New*
alpha-HCH	Oral, chronic	0.9 µg/kg/day	8 µg/kg/day	*Yes*
beta-HCH	Oral, acute	80 µg/kg/day	50 µg/kg/day	*Yes*
beta-HCH	Oral, intermediate	0.6 µg/kg/day	0.6 µg/kg/day	No
gamma-HCH	Oral, acute	3 µg/kg/day	3 µg/kg/day	No
gamma-HCH	Oral, intermediate	0.0008 µg/kg/day	0.01 µg/kg/day	*Yes*
1,2,3,6,7,8-hexa chlorodibenzofurans	Oral, intermediate	5 ng/kg/day	No value in PHAST	*New*
1,2,3,7,8-penta chlorodibenzofuran	Oral, intermediate	7 ng/kg/day	No value in PHAST	*New*
2,3,4,7,8-penta chlorodibenzofuran	Oral, acute	0.5 ng/kg/day	1 ng/kg/day	*Yes*
2,3,4,7,8-penta chlorodibenzofuran	Oral, intermediate	7 pg/kg/day	30 pg/kg/day	*Yes*
2,3,4,7,8-penta Chlorodibenzofuran	Oral, chronic	4 pg/kg/day	No value in PHAST	*Yes*
N-nitrosodimethylamine	Oral, acute	0.01 ug/kg/day	0.01 ug/kg/day	No
Nitrophenols	Oral, inhalation	None	None	No

Another way to check for changes in MRLs is to click "Contaminant Updates" on the Public Health Assessment Site Tool (PHAST) homepage (Figure 1). You can then open an Excel file that shows recent updates to the PHAST database, including changes to MRLs. The file shows the old and new MRLs and informs you about other changes to PHAST.

If MRLs change while you're developing or clearing your document, you'll need to update it to the new MRL. Talk to your office associate director for science (ADS) or technical project officer.

Postscript: In September and August 2023, our tox profile group released eight more tox profiles. The next newsletter will cover these profiles in more detail. The Toxicological Profiles page features a list of recently released profiles.

Figure 1. The PHAST home screen

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How to Evaluate Chemical Exposure When a Health Guideline Is Not Available

We've all been trained to compare site-specific values with ATSDR's MRLs after calculating site-specific oral doses or air concentrations. We might have MRLs for oral and inhalation exposures for up to three durations of exposure:

- acute (≤ 14 days)
- intermediate (15 to 364 days)
- chronic (≥ 365 days)

When MRLs are not available, health assessors can use the U.S. Environmental Protection Agency's (EPA) reference dose (RfD) for oral exposures and reference concentration (RfC) for inhalation exposures. PHAST's health guidelines are either final or provisional MRLs from ATSDR. The RfDs and RfCs in PHAST generally come from EPA's Integrated Risk Information System (IRIS).

But what happens when MRLs, RfDs, or RfCs aren't available? You could search for a health guideline published by another organization. EPA programs, such as the pesticide program and the Office of Water, develop RfDs and RfCs. EPA will sometimes report them in its regional screening level (RSL) database. IRIS doesn't report these RfDs and RfCs because they have not received EPA-wide clearance or gone through EPA's peer review process.

If you use an RfD or RfC from the RSL table that's not reported in IRIS, you need to work with your ADS office to ensure it's appropriate. This process involves you identifying and presenting the basis for the RfD or RfC to your ADS office. A state or the World Health Organization (WHO) might also have health guidelines. The same rule applies for describing the basis to your ADS office to get approval to use the health guideline.

But what can you do if health guidelines are not available?
You can still compare site-specific doses and concentrations to NOAELs (no observed adverse effect levels) and LOAELs (lowest observed adverse effect levels) for that chemical. If ATSDR has a toxicological profile for the chemical, this comparison is an easy step, provided studies are available.

You can compare site-specific doses and concentrations to the NOAELs and LOAELs reported in the Levels of Significant Exposure (LSE) figures and table in the tox profile. You'll still need to decide whether your site exposures are approaching or exceeding effect levels, just like you would if those exposures exceeded a health guideline. There might be additional uncertainty in this comparison because there were too few studies or the studies available were not robust enough for deriving a health guideline. In this situation, your uncertainty will be greater, which you'll need to mention in your evaluation.

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Health Assessment of Sites with Vapor Intrusion Mitigation Systems

Vapor intrusion mitigation systems (VIMS) are sometimes installed in buildings at sites where volatile contaminants in soil or groundwater beneath or near buildings cause vapor intrusion [ATSDR 2016]. These mitigation systems are often, but not always, very effective at reducing vapor migration into buildings.

Active VIMS
Active VIMS use a powered fan to pull vapors from beneath the lowest building floor. They pull soil gases from beneath the slab or membrane (plastic sheeting over the ground) or from the crawl space and vent it to the atmosphere. The extraction process creates a lower pressure in the subfloor zone to prevent soil gas entry into the building. Active VIMS usually consist of a pipe that is sealed to an opening in the slab, membrane, or crawl space. A fan within the pipe extracts and vents the vapors outdoors above the roofline, where they safely dissipate. Vapor entry points, such as sumps, hollow block walls, and drains, can also have depressurization systems. Cracks and openings in the slab or membrane are sealed to minimize indoor air being pulled into the system.

Other types of VIMS

Passive depressurization systems are configured like active depressurization systems but don't have a powered fan. They rely on natural driving forces such as wind-driven turbines, solar-powered fans, and advection to move soil gases to the outdoors. Passive systems aren't as good at preventing vapor intrusion as active systems are. But they're easily converted to active systems when a fan is placed in the pipe. This is an advantage, especially for new construction. We can also improve indoor air quality for buildings with vapor intrusion concerns by

- increasing ventilation that brings in more fresh air (on good air quality days)
- installing indoor air purification systems
- sealing cracks and openings in floors or walls

Reviewing data related to VIMS for public health assessments

Health assessors review various types of VIMS data as part of the vapor intrusion assessment process.

- Data could show an increase in indoor air concentrations following installation of the VIMS. This might indicate that the system is not working properly. Vapors could also be pulled indoors through a preferential pathway, such as the base of an improperly sealed toilet.
- In rare cases, poorly positioned VIMS exhaust points allow effluent to reenter buildings through nearby air intakes.
- Field personnel sometimes monitor VIMS exhaust to verify system function and determine contaminant removal rates, but the results don't represent exposures.
- Monitoring pressure difference across the floor shows the radius of influence (depressurization) at locations away from the extraction point. Areas that are not depressurized are susceptible to vapor intrusion.
- Monitoring during cold and hot weather, when windows and doors remain mostly shut (closed door conditions), is most likely to represent worst-case conditions for increasing indoor air concentrations from vapor intrusion.
- Temperature, pressure, precipitation, and radon levels provide supporting evidence for whether or not VI was active during sampling events [ATSDR 2022].
- Background sources could be indicated by comparing the results of concurrent indoor air, subfloor gas, and outdoor air samples. Contaminants move from areas of high to low concentration. For example, indoor air contamination is likely from vapor intrusion if sub-slab gas concentrations are greater than indoor air concentrations. Indoor air contamination is likely from an indoor background source if indoor air concentrations are greater than sub-slab gas and outdoor air concentrations.

We must review additional information, such as source characterizations and trends, to ensure that sampling adequately represents exposures over time.

Timing of sampling
We can assess exposures as

- pre-mitigation and post-mitigation exposures
- exposures over the whole period of interest
- exposures using other scenario-dependent durations

EPA guidance generally recommends 24-hour indoor air sampling at approximately 30, 90, 180, 270, and 365 days post-mitigation. This confirms that the mitigation system functions effectively [EPA 2020]. Sampling can occur more or less frequently based on site-specific considerations such as

- severity of risk or hazard
- building use
- system technology
- source strength, location, and trends
- building accessibility
- funding

Alarm activation, floods, earthquakes, building alterations [ATSDR 2019], construction blasting, or formation of nearby sinkholes could trigger the need for additional sampling.

Sampling approximately 30 days after completion of the mitigation system, building, or other changes helps to ensure that the system remains effective. Remediation activities at the source that increase vapor pressure (e.g., in situ thermal treatment) or affect contaminant migration (e.g., in situ steam enhanced extraction or open pit soil removal) can increase vapor intrusion. This supports the need for monitoring nearby buildings during and after such activities. After a year of system monitoring, annual or other periodic indoor air sampling (where possible) can verify continued system performance. Health assessors should review existing sampling data to determine if there is sufficient information to make a public health determination. If not, they should work with stakeholders to determine if collecting additional samples is feasible.

Reviewing ongoing operations and maintenance (O&M) activities
Health assessors usually aren't involved in implementing O&M activities. But they should check if ongoing O&M is planned and that the VIMS will continue to protect public health. Building-specific O&M manuals or other site-specific documents (e.g., work plan, remedial design, record of decision) might include VIMS information about operation, maintenance, and monitoring. Sometimes VIMS O&M responsibility will be transferred to different stakeholders or to building owners after mitigation system verification.

Ongoing periodic VIMS and building inspections could identify maintenance or mitigation system needs over time. Building owners and occupants might get a VIMS manual that describes the following:

- why the mitigation system was installed
- how it works
- who to contact if the system malfunctions
- information about routine inspection and maintenance
- what to do during or after a prolonged power outage

Routine sampling events will likely include VIMS inspections. If annual indoor air sampling is not possible, annual inspections of mitigation systems help to confirm continued operation as designed.

EPA's region 5 vapor intrusion handbook Appendix J [EPA 2020] contains an O&M inspection form that includes confirmation of the following:

- VIMS system components (fans, pipes, caulking, electrical components, gauges, alarms)
- air treatment and ventilation systems
- O&M manual (present and accessible to occupants)
- VIMS or building alterations
- occupancy changes
- building occupant knowledge about the system and any other concerns

Health assessors should recommend ongoing O&M activities and prompt actions to protect public health. More detailed information on VIMS is available from the Interstate, Technology, and Regulatory Council [ITRC 2020].

Long-term stewardship
VIMS are generally not a primary remedy—they're often an interim measure to prevent soil gases from migrating up into buildings while the source is being remediated. Remedial actions and monitoring of the vapor source in groundwater or soil are generally taken separately. Mitigation systems can be turned off after sub-slab gas and groundwater no longer exceed vapor intrusion comparison values (VICVs), the building is demolished, or vapor intrusion is otherwise no longer a concern.

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508 Tips and Tricks: Accessibility Checker in Word

ATSDR documents that are posted online need to be 508-compliant. This newsletter features a series of articles about common issues in making your public health documents 508-compliant.

For this edition of 508 Tips and Tricks, we are discussing using the accessibility checker in Microsoft Word as you write your document. It's located at the top of the Word document, under the review tab.
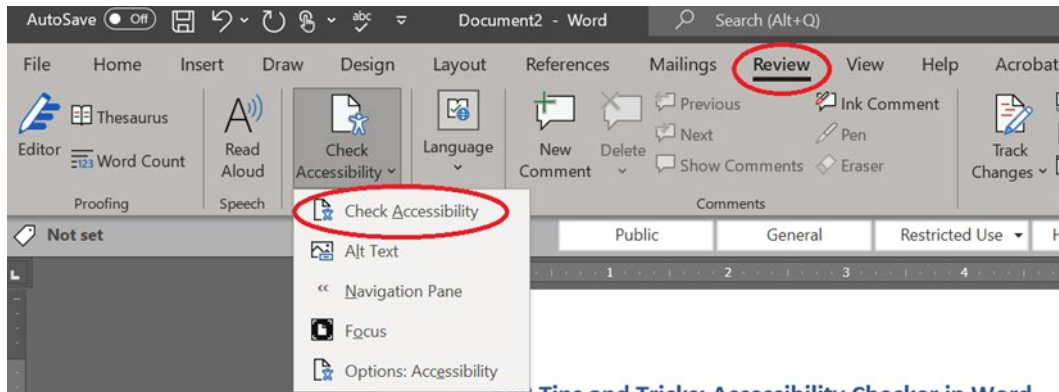

Figure 2. Screenshot of the accessibility checker in Word

Once you have selected check accessibility, a panel will appear on the right displaying the errors in your document.
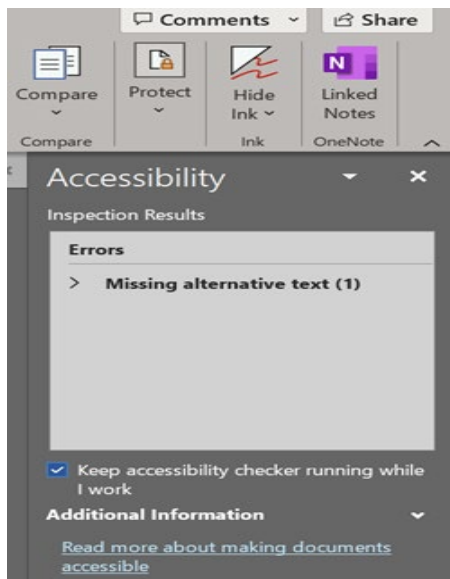

Figure 3. Screenshot of accessibility panel that displays errors in a document

You can also select or de-select a box that will keep the accessibility checker running while you work in the document. It's a good idea to make sure this box is selected.

The accessibility checker helps you fix many 508 errors as you create your document. It can identify anything you might have missed and speed up the 508 review process. Other Microsoft Office products such as Outlook and PowerPoint also have accessibility checkers. But please note that automated checkers don't catch everything, so a manual 508 review is still required.

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Linking to Outside Websites in ATSDR Public Health Documents

What follows is based on the NCEH/ATSDR policy and procedure document on clearing information for public use (Appendix D).

Health assessors should be cautious about linking to other websites in their public health documents. NCEH/ATSDR established the following guidelines:

- Government (.gov) sites: Linking to gov sites is acceptable.
- Partners: Linking to partners' sites is acceptable.
- Education (.edu) sites: Linking to edu sites is possibly acceptable; author must thoroughly review content.
- Organization (.org) sites: Linking to org sites is possibly acceptable; author must thoroughly review content.
- Network (.net) sites: Linking to net sites is not recommended.
- Company (.com) sites: Linking to com sites is not permitted.
- Sites with advertising, policies, or subject matter that CDC/ATSDR does not endorse: Linking to such sites is not permitted.
- Sites that link to sites listed in the preceding bullet: Linking to such sites is not permitted.

Authors are responsible for periodically monitoring linked sites to ensure that content and tone do not conflict with CDC/ATSDR policies.

Source: National Center for Environmental Health/ATSDR Policy and Procedure, Clearance of Products for Public Use, November 2016. Available at [NCEH/ATSDR Clearance Policy (cdc.gov)](https://cdc.gov).

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Judging a Document by its Cover: How to Name Your Document

When you're looking for a document that evaluates a specific chemical, you might find yourself opening each document that pops up, hunting for the information. Below is a tip for naming documents that saves time, money, and aggravation.

Searchable Databases

Our databases, such as ATSDR Request Management Service System (ARMSS) and Sequoia, keep all the electronic information you enter. Various people use this information for various reasons. We might get a congressional inquiry for the number of sites we evaluated for per- and polyfluoroalkyl substances (PFAS). Our contractors, students, and fellows can use the data to look for trends among sites with certain chemicals. Health assessors might want to find documents that explain how other authors evaluated certain chemicals in certain media. ATSDR's website contains public health assessments and health consultations published since 2007 that can search document titles for keywords [ATSDR 2007]. Titles that include contaminant names and media allow users to quickly and easily find documents.

Meaningful Naming Strategy

To aid database searches for documents with specific content, name your documents with a two-tier structure that provides meaningful information. The first tier should include the chemicals and media on which the conclusions are based. The second tier is the official site name usually associated with the EPA site identification number, facility number, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) number.

Example of meaningful naming:

First Tier: Evaluation of Lead in Soil at Sunshine Park

Second Tier: Sunshine Heights Air Station, Sunshine County, Georgia

Example of unhelpful naming:

First Tier: Public Health Implications of Exposures to Site Contaminants

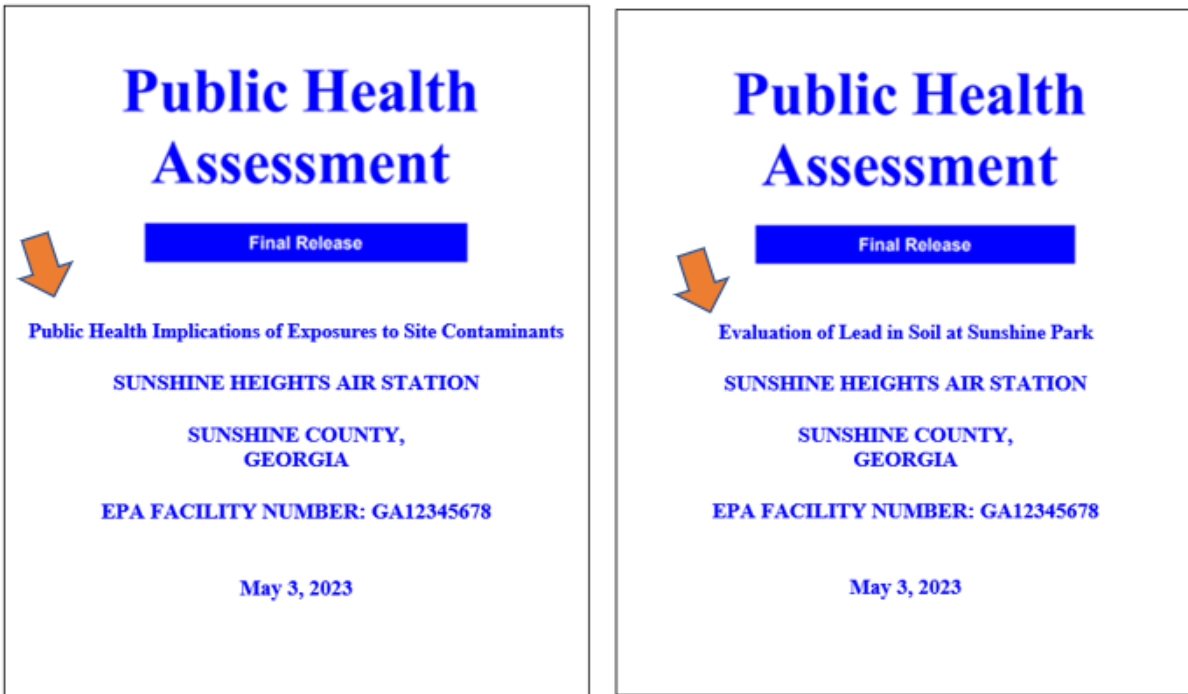Second Tier: Sunshine Heights Air Station, Sunshine County, Georgia

Figure 4. Example of unhelpful document name compared to meaningful document name

Questions and Answers:

1. **What if my site has more than one chemical?**

First, consider the chemical drivers of your conclusions. While you might have screened a hundred chemicals, only a handful could require further evaluation. Of those needing further evaluation, it is likely that only a few formed the basis of your conclusions. For documents that have more than two chemicals per media, use the chemical category for naming. See examples below.

Table 2. Examples of using chemical category to name documents

Chemical Drivers	First Tier Naming Example
lead and mercury	Evaluation of Lead and Mercury in Soil at Sunshine Park
lead, mercury, arsenic, and cadmium	Evaluation of Metals in Soil at Sunshine Park
lead, mercury, arsenic, cadmium, 2,4-D; DDT; and DDE	Evaluation of Metals and Pesticides in Soil at Sunshine Park

2. What if my site has different media?

Consider the media drivers of your conclusions. If the drivers of your conclusions involve more than one medium, add the medium to the title.

Table 3. Examples of using media to name documents

Media Drivers	First Tier Naming Example
two chemicals in same two media	Evaluation of Lead and Mercury in Soil and Drinking Water at Sunshine Park
multiple chemicals in same two media	Evaluation of Metals in Soil and Drinking Water at Sunshine Park
multiple chemicals in different media	Evaluation of Metals in Soil and Pesticides in Drinking Water at Sunshine Park

3. Do I need to include the location in the name?

Adding the location to the title is optional and depends on several considerations. See examples below.

Table 4. Examples of using location to name documents

Consideration for Including Location in First Tier Name	Include Location in Name
If the evaluated area is the site name (first and second tiers are the same)	No
If the evaluated area is one of many areas evaluated, but is the only area that is the driver for the conclusions (i.e., a health hazard)	No
If the evaluated area is the only area evaluated among many areas not evaluated	Yes
If the title is short and adding the location adds meaningful information	Yes
If the title is already 3 lines long and just makes it confusing	No

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Take a Screenshot and Minimize the Hassle of Resizing and Cropping

We have all tried to show others a snippet of our computer screens, maybe with the "Print Screen" button. Cropping the image is simple enough when you're using a single screen, but it can be more challenging with multiple monitors. The Snipping Tool is exactly what you need! You can access it through the Start Menu at the bottom left of your screen. There's also a quick version (Windows key + Shift + S) that allows you to draw a box for a screenshot and copies it to the clipboard. You can then paste it with the classic Ctrl + V into any document or email after.

Bonus tip: If the image you want to share is too small, hold Ctrl and scroll up with your mouse scroll wheel. This zooms in, keeping you from having to resize and potentially lose resolution of your screenshot.
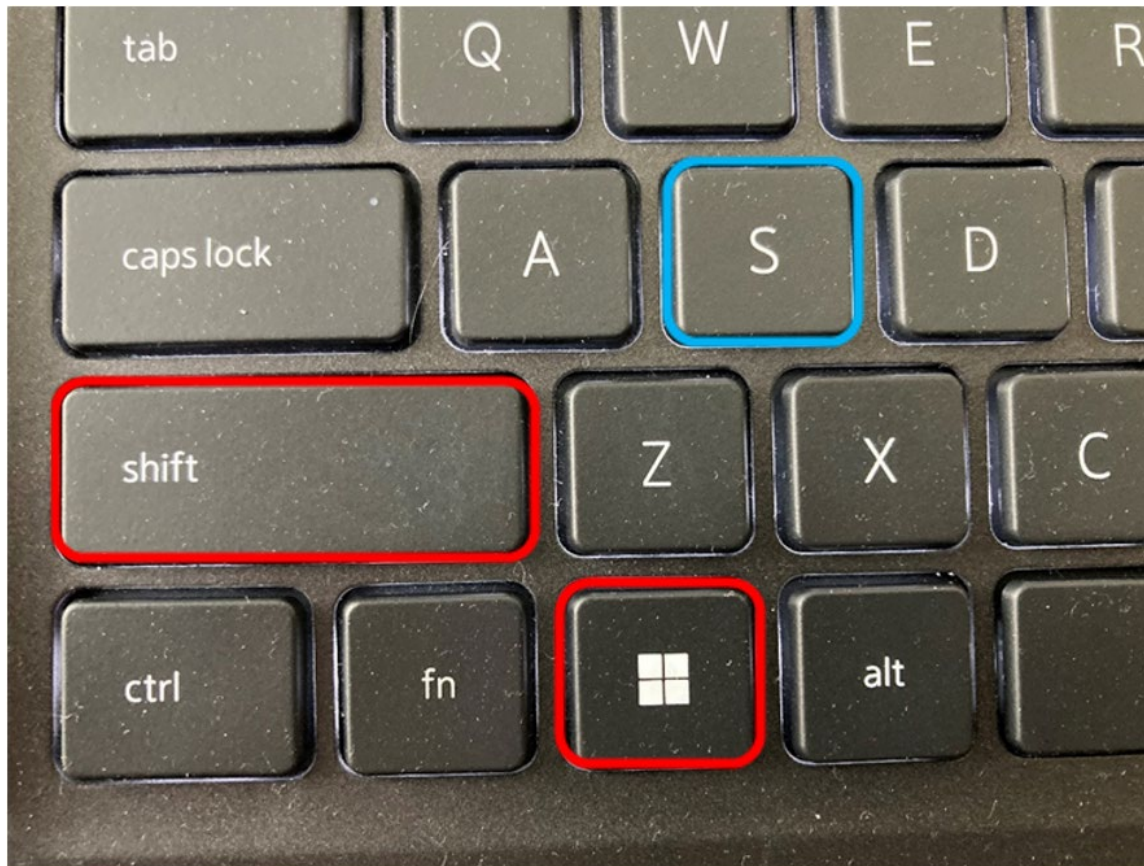

Figure 5. Image of a keyboard showing the two keys to hold down (red boxes), shift and the windows key, and the S key to press (blue box) to rapidly take a screenshot by drawing a box.

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Typography Tips for Increasing Readability

Typography is the design and selection of letters and characters. A small change in font style, letter size, or spacing can change the look and feel of your document and make your document easier or more difficult to read.

Typography can help or hinder your document's readability. Use the following tips to improve your readers' experiences.

1. **Use mixed case and lowercase letters.**

    Mixed and lowercase letters are easier to read. Mixed case is also called sentence case because we typically write sentences using a mix of upper- and lowercase letters. Avoid using all CAPITALIZED letters for more than a brief heading, acronym, or initialism.

2. **Use left alignment.**

    Use the default left alignment setting for most of your work, including headings. Text that is centered, right aligned, or justified can be harder to read.

3. **Ensure there is a high color contrast between your text and background.**

    Dark text on a light background is the most visible. For example, many programs use black text on a white background by default. If you use a different color combination, ensure your letters can be seen clearly. Avoid using really bright colors, like a shocking orange. Also avoid using colors that could be hard to distinguish from each other. For example, red and green, a dark blue and black, or a light gray and a dark gray. You can use WebAIM to check your color contrast ratio. The minimum color contrast ratio that CDC requires is 4.5:1.

4. **Avoid using tiny font sizes.**

    Small text is very hard to read. Use larger fonts to ensure everyone understands your message. Use a 12 point or larger font for your documents.

5. **Avoid underlines and italics.**

    Underlined words and *italicized words* are harder to read, especially with longer texts. Instead, use **bolded fonts**, spacing, and **colors** to help call out important information. Please note that to indicate emphasis, color must be used with font changes such as bolding and larger font sizes. Color should never be used alone or with underlining to indicate emphasis.

Here are some additional resources that might be useful.

- [Make It Shine: Focus on Format and Layout | NCEH | CDC](#)
- [WebAIM: Typefaces and Fonts](#)
- [How type influences readability – Fonts Knowledge – Google Fonts](#)
- [Design for readability | Digital Accessibility (harvard.edu)](#)

Source: ATSDR Writing Tip Wednesday, February 1, 2023

Contributing author: NCEH/ATSDR Writer-Editor Services

References

[ATSDR] Agency for Toxic Substances and Disease Registry. 2016. ATSDR's guidance for evaluating vapor intrusion pathways. Available at: https://www.atsdr.cdc.gov/pha-guidance/resources/ATSDR-SVI-Guidance-508.pdf

[ATSDR] 2007. ATSDR Public health assessments and health consultations. Available at: https://wwwn.cdc.gov/TSP/PHA/PHALanding.aspx

[ATSDR] 2019. Fact sheet template: Home alterations and vapor intrusion. Available at: https://www.atsdr.cdc.gov/pha-guidance/resources/atsdr-home-alterations-vi-fact-sheet-template-508.pdf

[ATSDR] 2022. ATSDR newsletter for health assessors including APPLETREE partners: Tips on assessing vapor intrusion lines of evidence. Jan. Available at: https://www.atsdr.cdc.gov/pha-guidance/resources/ATSDR-Newsletter-for-Health-Assessors-January-2022-508.pdf

[ITRC] Interstate Technology Regulatory Council. 2020. Vapor intrusion mitigation. Available at: https://vim-1.itrcweb.org

[EPA] U.S. Environmental Protection Agency. 2020. USEPA Region 5. Vapor intrusion handbook. Available at: https://semspub.epa.gov/work/05/978577.pdf