Message

From: RecycledTireCrumb [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=9DEB311BBCBE4D7387D112B26C1D4AF0-RECYCLEDTIR]
Sent: 3/24/2020 6:12:32 AM
To: Karen Mathewson, M.D Ex. 6 Personal Privacy (PP)
Subject: RE: Study findings regarding leaching of chemicals
Attachments: Lit Review and Gaps Analysis - Literature Excerpts for Leaching - Stormwater - EcoTox.docx; Lit Rev and Data Gap Analysis for Leaching -Stormwater - EcoTox.xlsx

Hi Karen.

Thank you for your inquiry and sorry for the delay in getting back to you. While the Federal Action Research Plan focused on the potential for human exposure, the 2016 Literature Review and Data Gaps Analysis did survey literature that included topics such as leaching, stormwater run-off, ecological exposure and toxicity, and cumulative risk related to tire crumb rubber and synthetic turf fields. We would direct you to the Tire Crumb Research Study State-of-the-Science Literature Review/Gaps Analysis for additional information.

We have attached a list of example relevant references (through mid-2016) from the FRAP Literature Review/Gaps Analysis. More recent research relevant to these topics may be available but have not been surveyed by the FRAP research team.

Regarding your question on cumulative cancer risks, several papers/reports have examined or assessed potential cancer risks for individual chemicals, but the only citation from our FRAP Lit Review/Gaps analysis that addresses cumulative cancer risks was:

> **Ruffino, B; Fiore, S; Zanetti, MC. (2013). Environmental Sanitary Risk Analysis Procedure Applied to Artificial Turf Sports Fields. Environ Sci Pollut Res. 20:4980–4992. DOI 10.1007/s11356-012-1390-2**
> "For all the fields and for all the routes, the cumulative carcinogenic risk proved to be lower than 10−6 and the cumulative noncarcinogenic risk lower than 1. The outdoor inhalation of dusts and gases was the main route of exposure for both carcinogenic and non-carcinogenic substances....the inhalation of atmospheric dusts and gases from vehicular traffic gave risk values of one order of magnitude higher than those due to playing soccer on an artificial field."

Please note that **Peterson et al. (2017)** assessed an excess lifetime cancer risk by summing risks across all of the 'chemicals of potential concern' that made it through their chemical screening process. Here is an excerpt on this paper from our 2019 report Appendix B:

> **Peterson, Michael K., Lemay, Julie C., Pacheco Shubin, Sara, & Prueitt, Robyn L. (2018). Comprehensive multipathway risk assessment of chemicals associated with recycled ("crumb") rubber in synthetic turf fields. Environmental Research, 160, 256-268. doi:https://doi.org/10.1016/j.envres.2017.09.019**
> "Estimated non-cancer hazards and cancer risks for all the evaluated scenarios were within US EPA guidelines. In addition, cancer risk levels for users of synthetic turf field were comparable to or lower than those associated with natural soil fields."

Again, sorry for the delay and let me know if you have any other questions.

Best regards,

jose

José L. Zambrana, Jr., PhD

Senior Science Advisor, Center for Environmental Measurement and Modeling (CEMM)
Office of Research and Development (ORD), US EPA
(213) 244-1819 [office]
Ex. 6 Personal Privacy (PP) mobile]

From: Karen Mathewson, M.D. Ex. 6 Personal Privacy (PP)
Sent: Tuesday, November 26, 2019 8:45 PM
To: RecycledTireCrumb <RecycledTireCrumb@epa.gov>
Subject: Re: Study findings regarding leaching of chemicals

Thank you for the information. We are particularly concerned about this proposal for a turf field bc it will be built on freshwater emergent wetlands and it will abutt established freshwater wetlands. Do you know any work looking at proximity of artificial turf to wetlands?
Also, any work that looks at the effect on cumulative cancer risk of exposure to multiple carcinogens and/or over longer periods of time than that which is typical of intermittent play on these fields- ie living next to the fields?
Thanks so much for your help.
Karen Mathewson, MD

On Tue, Nov 26, 2019 at 4:02 PM RecycledTireCrumb <RecycledTireCrumb@epa.gov> wrote:

> Hi Karen.
>
> Thanks for your inquiry. The FRAP research does not include assessments of leaching of chemicals to the environment, nor potential ecological exposures and impacts. In the FRAP Literature Review and Data Gaps Analysis, while our focus was on human exposures and impacts, there are 36 literature citations related to studies of leaching and 7 citations related to stormwater run-off:

Table B-4. Number of Studies that Addressed Various Topic Areas	
Leaching	36
Human Risk	32
Human Exposure	27
Eco Exposure/Risk	26
Literature Review	24
Toxicity Assessment	19
Constituent Characterization	16
Headspace/de-gassing-Bulk (lab)	13
Off-gassing/volatilizing (field)	12
Site Monitoring	12
Data Gaps	11
Stormwater Runoff	7
Microbial	7
Production Process	6
Bioavailability	5
Modeling	5
Site Characterization	4
Biomonitoring	3
Risk Communication	2
Epidemiologic	0
Other	31

We hope you find this information helpful.

Sincerely,

José L. Zambrana, Jr., PhD

Senior Science Advisor, Center for Environmental Measurement and Modeling (CEMM)

Office of Research and Development (ORD), US EPA

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Ex. 6 Personal Privacy (PP) obile]

José Zambrana

From: Karen Mathewson, M.D. Ex. 6 Personal Privacy (PP)
Sent: Friday, November 01, 2019 4:56 PM
To: RecycledTireCrumb <RecycledTireCrumb@epa.gov>
Subject: Study findings regarding leaching of chemicals

To whom it may concern:

Thank you for your work on tire crumb rubber. I was wondering if there is any data on chemicals or metals being found in stormwater oor runoff from the fields?

The city I live in is contemplating putting an artificial turf field in a neighborhood abutting homes and a riverine which drains into Lond Island sound and I am wondering if there is any work being done on how this type of exposure which would be more chronic is being looked at.

Thank you-

Karen Mathewson MD

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Karen Mathewson, MD

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