An exploration of the working conditions of women employed in mining operations at a platinum mine in South Africa

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DECLARATION

By submitting this dissertation electronically, I solemnly declare that I authored the work contained within. The dissertation is submitted in fulfilment of the requirements for the Master of Arts in Industrial Sociology degree at the Potchefstroom Campus of North-West University.

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ABSTRACT

This study explored the working conditions of women employed in mining operations at a platinum mine in South Africa. Historically, the mining industry has been male-dominated, and women's employment in underground work in mines was legally restricted by the International Labour Organization's labour standard titled Underground Work (Women) Convention, 1935 (No. 45), which was replaced by the Safety and Health in Mines Convention, 1995 (No. 176). Countries that ratified Convention No. 176 moved towards gender-neutral policies that focused on ensuring the health and safety of all workers in all operations, including women. In South Africa, particularly, the Employment Equity Act of 1998, the Mine Health and Safety Act of 1996, the Mineral and Petroleum Resources Development Act of 2002 and the Mining Charters of 2004, 2010 and 2018 have gradually facilitated women's inclusion in the mining industry. Although women's participation in the South African mining industry has significantly increased, the mining industry remains a challenging environment for women; they face various barriers, which are often indicated as reasons why women leave the industry and why mining companies do not meet their set targets as stipulated by the Mining Charter. This study investigated the 'gender problem' in mining companies through feminist theory and feminist treatments of organisations and change.

This study employed a quantitative research methodology guided by an objectivist ontology, an empiricist epistemology and a positivist research paradigm. Data was collected through a structured questionnaire administered to women working in mining operations at a selected platinum mine in South Africa. The questionnaire comprised both closed- and open-ended questions, facilitating a comprehensive analysis of the factors affecting women's working conditions. The data was analysed using exploratory factor analysis, descriptive statistics and inferential statistics to identify the key trends and relationships.

The data yielded significant insights regarding respondents' demographics and various aspects of their working conditions. Of the 200 questionnaires distributed, 196 were returned, indicating a high response rate. The majority of respondents were black African women aged 30 to 39, predominantly married with children and possessing secondary education. Most had 11 to 20 years of underground work experience, motivated by unemployment, job insecurity and the pursuit of stable employment. While the mining company provided housing, medical aid, pensions and maternity benefits, it was deficient in travel allowances, childcare support and other essential benefits, suggesting a need for enhanced support for female employees, particularly those with young children. Despite the implementation of effective gender-sensitive policies, awareness of the company's professional development programmes for women was limited, indicating a necessity for improved support for women's career

advancement. Women perceived themselves as physically capable but noted specific physiological challenges, highlighting the need for tailored support systems. Health and safety measures were generally adequate; however, there remains a need for gender-sensitive personal protective equipment and maternity-related support, particularly for underground workers. Regarding workplace practices, issues of gender discrimination and sexual harassment were prevalent, which have a negative impact on women's experiences.

This study significantly contributes to the academic discourse on gender equity in the mining industry by highlighting women's unique challenges in this traditionally male-dominated industry. Providing empirical insights and recommendations equips policymakers and industry leaders with strategies to foster a more inclusive and equitable work environment.

Key terms: Mining Charter, mining industry, mining operations, South Africa, women, working conditions

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LIST OF ACRONYMS AND ABBREVIATIONS

ANOVA	Analysis of variance
AusIMM	Australasian Institute of Mining and Metallurgy
AWRA	Australian Women in Resources Alliance
BaSSREC	Basic and Social Sciences Research Ethics Committee
BCEA	Basic Conditions of Employment Act
CCMA	Commission for Conciliation, Mediation and Arbitration
CMMP	Canadian Minerals and Metals Plan
DMR	Department of Mineral Resources
DMRE	Department of Mineral Resources and Energy
DoL	Department of Labour
EEA	Employment Equity Act
GDP	Gross domestic product
HDSAs	Historically disadvantaged South Africans
ILO	International Labour Organization
IWIM	International Women in Mining
KMO	Kaiser-Meyer-Olkin
LIMAP-GH	Ladies in Mining and Allied Professions in Ghana
LRA	Labour Relations Act
MHSA	Mine Health and Safety Act
MPRDA	Mineral and Petroleum Resources Development Act
MQA	Mining Qualifications Authority
NEDLAC	National Economic Development and Labour Council
NWU	North-West University
PEPUDA	Promotion of Equality and Prevention of Unfair Discrimination Act
PPE	Personal protective equipment
STEM	Science, Technology, Engineering and Mathematics
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
WIMC	Women in Mining Canada
WIM Brazil	Women in Mining Brazil

WIM Ghana	Women in Mining Ghana
WIMARQ	Women in Mining Resources Queensland
WIMSA	Women in Mining South Africa
WIMWA	Women in Mining and Resources Western Australia

CHAPTER ONE

INTRODUCTION, PROBLEM STATEMENT AND RESEARCH METHODOLOGY

1.1 INTRODUCTION AND BACKGROUND

This study explored the working conditions of women employed in mining operations at a platinum mine in South Africa.

The International Labour Organization (ILO) (2020) defines working conditions as the core of paid labour and employment relationships that cover a wide range of topics and issues, from working hours to remuneration, as well as the physical conditions and mental demands within the workplace. Mining operation is defined as “any operation relating to the act of mining and matters directly incidental thereto” (RSA, 2002a:5) and includes, but is not limited to, “open mining and surface operation and the disposal of refuse from surface, underground, and in situ mining” (Law Insider, 2021).

Traditionally, mining was viewed as a male-dominated occupation, as employment in extractive industries was predominantly viewed as a man’s job (Benya, 2009:1; Pretorius, 2016:3). Furthermore, ILO Convention 45 of 1935, Article 2, stipulated that “no female, whatever her age, shall be employed on underground work in any mine” (ILO, 1935). The Convention, therefore, prohibited any form of manual labour for women underground globally. However, this excluded women who were in management positions and did not perform manual labour, those who were employed in health and welfare services, and those who were still busy with their studies (ILO, 1935). Many countries that initially ratified the convention have since ‘denounced’ it (Mining Council, 2020:1), including Sweden (1967), Canada (1987), New Zealand (1987), Australia (1988), Ireland (1988), the United Kingdom (UK) (1988), South Africa (1996), Chile (1997), Finland (1997), Peru (1997), the Netherlands (1998), Zambia (1998), Austria (2008), Belgium (2008), the Czech Republic (2008), France (2008), Germany (2008), Italy (2008), Poland (2008), Slovakia (2008), Slovenia (2008), Spain (2008) and Zimbabwe (2008). The Convention has since been revoked by the decision of the International Labour Conference at its 112th session, which took place from 3 to 14 June 2024 (ILO, 2024). Many of these countries are now signatories to ILO Convention 176 on Safety and Health in Mines (ILO, 1995), which covers the rights of all workers.

Over the years, women have forged their way through set boundaries in the global mining industry, but their numbers still remain low. They have entered the industry since the inception

of specific laws and legislation encouraging and requiring gender equity in the workplace, including the mining industry (Botha, 2015; Lahiri-Dutt, 2015; Lahiri-Dutt & Macintyre, 2006:4; Mudimba, 2017). Furthermore, the objective of Sustainable Development Goal 5 is to achieve gender equality, empower women and girls, and ensure their full participation in all economic sectors, including mining, to promote healthy and prosperous societies (United Nations, 2015:16). The alignment with Sustainable Development Goal 5, Target 5.5, the promotion of gender equality in mining, encourages equal opportunities for women in terms of employment, leadership roles and participation in decision-making processes at all levels in the mining industry, thereby fostering an inclusive and equitable sector (United Nations, 2015). Weldegiorgis (2022:v) states that women comprise 16% of Australia's mining workforce. In Canada, women accounted for 19% of the workforce in the mining, quarrying and oil and gas sectors in 2022 (Peltier-Huntley, 2022:1). Moreover, women continue to be underrepresented in all aspects of small-scale mining operations in the UK, with only 16% of mining workers being female (Peltier-Huntley, 2022:iii). In Ghana, women made up 10% of the employees in large-scale mining in Africa (Kansake *et al*., 2021:2). The National Institute of Statistics of Rwanda has reported that 11.4% of all workers across the 30 districts are female, primarily engaged in artisanal and small-scale mining activities. In Zimbabwe, it is estimated that around 10% of small-scale artisanal miners, which amounts to 535 000 women, are involved in these operations (Chimoio, 2022).

Before the late 1990s, the mining industry in South Africa was male-dominated (Badenhorst, 2009:55; Calitz, 2004:1). The employment of women in underground mining was prohibited by legislation such as the Mines and Works Act 12 of 1911 and 27 of 1956) (RSA, 1956). However, in 1996, there were two significant developments: the first was the introduction and implementation of the new South African Constitution (RSA, 1996a), which recognised and promoted gender equality, and the second was the introduction of the Mine Health and Safety Act (MHSA) 29 of 1996, which protects the health and safety of persons at mines and provides for effective monitoring of health and safety conditions (Mokotong, 2016:20; RSA, 1996b).

In 1998, the South African Employment Equity Act (EEA) 55 of 1998 was introduced, and discrimination based on gender, race, and religion within the workplace was prohibited (RSA, 1998a). Furthermore, new mining legislation, such as the Mineral and Petroleum Resources Development Act (MPRDA) 28 of 2002 and the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry (the Mining Charter), was introduced, which required women's active participation in the mining industry (RSA, 2002a, 2004). Ensuring higher levels of inclusiveness and advancement of women, the MPRDA and the Mining Charter required a 10% women participation in the mining industry within a five-year target,

due in 2009 (RSA, 2004). This opened many opportunities for women in the mining industry, as women were now allowed to occupy positions in mining operations equivalent to those of men (Botha & Cronjé, 2015c; Burtenshaw, 2005).

In 2009, the Department of Mineral Resources (DMR) conducted an impact assessment to determine the extent to which the objectives of the Mining Charter have been achieved. The report documented the progress made against each element of the Mining Charter. According to the results, it was evident that only 26% of mining companies had complied with the 10% women participation target (DMR, 2009:8). The average rate of women participation was 6%, with most of the women employed in supportive functions. Less than 1% of women fulfilled management positions, mainly reserved for white women (DMR, 2009:8).

In 2010, the Mining Industry Growth, Development and Employment Task Team, a tripartite initiative comprising government, organised business and organised labour (the DMR, the South African Mineral Development Association of South Africa, the Chamber of Mines, the National Union of Mineworkers, the United Association of South Africa and Solidarity), signed a declaration on a strategy for sustainable growth and meaningful transformation of South Africa's mining industry (DMR, 2015:5). This served as the basis on which the 2004 Mining Charter was amended. The amended Mining Charter (the second Mining Charter) focused on increasing the participation of historically disadvantaged South Africans (HDSAs) in the mining industry (RSA, 2010a), with the term 'historically disadvantaged South Africans' referring to "any person, category of persons or community, disadvantaged by unfair discrimination before the Constitution of the Republic of South Africa, 1993 came into operation" (RSA, 2004:9). To create a conducive environment to ensure diversity as well as the participation of HDSAs in all decision-making positions and core occupation categories in the mining industry, the amended Mining Charter required a minimum of 40% HDSA representation, which includes women (RSA, 2010a).

In May 2015, the DMR conducted a second assessment to measure the progress made concerning transformation in the mining industry against the targets of the 2010 Mining Charter. Even though the results revealed that the overall representation of women in the mining industry had increased to 10.5% by 2014, it was evident that there was still a long way to go before HDSAs, including women, were fully represented at all levels in the mining industry (DMR, 2015:28). After several drafts and a process of negotiation and consultation, the third Mining Charter was finally published on 27 September 2018 (DMR, 2018). The third Mining Charter requires a minimum of 50% HDSAs at board level with exercisable voting rights (20% should be women), a minimum of 50% HDSAs at executive management level (20% should be women), a minimum of 60% HDSAs at senior management level (25% should be

women), a minimum of 60% HDSAs at middle-management level (25% should be women) and a further 70% HDSAs at junior management level (30% should be women) (RSA, 2018:22–23). The new targets of the 2018 Mining Charter should be met within a five-year period from the publishing date, i.e. by September 2023 (RSA, 2018:10).

Nearly 15 years have passed since the introduction of the first Mining Charter in 2004. In August 2023, women represented 19.2% of women employees in the South African mining industry (MQA, 2023:11). Even though the number of women workers in the mining industry continues to rise, it remains difficult for the mining companies to reach a satisfactory level of gender equality and to meet the set requirements or targets of the Mining Charter (Mudimba, 2017). Since the introduction of the 2004 Mining Charter, various studies documented the challenges and experiences of women employed in the South African mining industry (Badenhorst, 2009:55; Botha, 2016, 2017; Calitz, 2004:1; Deery, 2008; Kaggwa, 2020:1; Mangaroo-Pillay, 2018; Moalusi & Jones, 2019; Mudimba, 2017; Peetz & Murray, 2011:22; Roos, 2014; Zungu, 2013). It is evident from these studies that the working conditions in the mining industry remain unfavourable for women. They continue to experience barriers related to gender and cultural stereotypes, work-life balance, career development, health and safety, and structural factors, among other conditions (Benya, 2009:27; Botha & Cronjé, 2015a:15; Dooley & Erhart, 2023:673; Mashaba & Botha, 2023:4; Thiart *et al*., 2023:6). These barriers are often indicated as reasons why women leave the industry and also why mining companies do not meet the set targets (Dooley & Erhart, 2023:673; Kaggwa, 2019:1; Moraka & Jansen van Rensburg, 2015:669; Parliamentary Monitoring Group, 2014). Therefore, mining companies need to pay attention to the working conditions of women workers, specifically those employed underground, to create a more favourable working environment for women and increase women's participation in the industry. Considering this background, the study sought to explore the working conditions of women employed in mining operations at a platinum mine in South Africa.

1.2 THEORETICAL FRAMEWORK

The 'gender problem' in mining companies was investigated through feminist theory and feminist treatments of organisations and change. According to Ritzer (2008:450), feminist theory is "a generalised, wide-ranging system of ideas about social life and human experience developed from a women-centred perspective". Furthermore, Ritzer (2008:450) maintains that feminist theory focuses on women in two ways: first, it investigates the situation and experiences of women in society, and second, it tries to describe the social world from the characteristic points of view of women.

Feminist theory aims to understand the nature of gender inequality and examines women's social roles, experiences and interests (Ritzer, 2008:450; Stewart & Zaaiman, 2014:158). While generally providing a critique of social relations, much of feminist theory also focuses on analysing gender inequality and the promotion of women's interests (Stewart & Zaaiman, 2014:158). Three broad phases (known as waves) in the development of feminist thinking are identified. The first wave occurred in the 19th and early 20th century and was mainly concerned with women's right to vote; the second wave arose in the late 1960s and 1970s and is also known as the women's liberation movement for equal legal and social rights, and the third wave began in the 1990s and refers to a continuation of, and a reaction to, second-wave feminism (Friedan, cited by Drucker, 2018:27).

According to Ely and Meyerson (2000a:104), the burgeoning literature on feminist theory and feminist treatments of organisational change suggests a variety of ways to classify different approaches to gender and the 'gender problem' in organisations. Kolb *et al*. (1998) identified three traditional approaches, as well as a fourth non-traditional approach, to analyse gender in organisations and to effect change in organisations. The first approach is to 'fix the women'. According to this approach, gender equity stems from a liberal strain of political theory, which means that individuals rise and fall on their own merits (Calas & Smircich, 1996:147–152; De Vries, 2010:49; Ely & Meyerson, 2000a:14; Kolb *et al*., 1998:10–11). According to this approach, gender is regarded as individual characteristic marked by one's biological male or female category. The approach argues that sex role socialisation produces individual differences in attitudes and behaviours between men and women, which have rendered women less skilled than men to compete in the world of business. These socialised differences account for inequalities between men and women in the workplace (De Vries, 2010:49; Ely & Meyerson, 2000a:105–106; Kolb *et al.*, 1998:10–11). This approach to change includes developing women's skills through training and mentoring, among others, to help individual women succeed and become role models when they succeed (De Vries, 2010:49; Ely & Meyerson, 2000a:106; Peterson, 2019:7–11).

The second approach is to 'value the feminine'. According to this approach, the conception of gender remains socialised differences between men and women. Its proponents argue that these differences should not be eliminated~~,~~ but rather celebrated (Ely & Meyerson, 2000a:108; Fletcher, 2001:163–186; Helgesen, 1990:119–125; Kolb *et al.*, 1998:11–12). Change can be brought to organisations with the development of interventions that aim to give a voice to women's perspectives and to articulate and exonerate women's ways of being, thereby leading to a revised social order in those organisations (Ely *et al*., 2011:5; Ely & Meyerson, 2000a:109; Peterson, 2019:3–9).

The third approach is to ‘create equal opportunities’ focusing on the structural barriers to women’s recruitment and advancement. From this perspective, gender is still framed as differences between men and women; however, these differences result not from socialisation processes~~,~~ but from differential structures of opportunity and power that block women’s access and advancement (Ely *et al*., 2011:475; Ely & Meyerson, 2000a:110; Kanter, 1987:257–263; Kolb *et al.*, 1998:12). These include hiring, evaluation and promotion processes that not only reflect sexist attitudes towards and expectations of women~~,~~ but also reward men’s structural position over that of women (Ely, 1995:589–590; Ely *et al*., 2011:474; Ely & Meyerson, 2000a:110; Peterson, 2019:7–11). Change can be effected in organisations through interventions that aim for equal opportunities for both men and women in the organisation by dismantling these structural barriers to equality (Bailyn *et al*., 1997:11–19; Ely, 1995:589–590; Ely & Meyerson, 2000a:111; Kolb *et al.,* 1998:12).

The fourth is a non-traditional approach to gender and is “distinguished by its conception of gender and its grounding in a different set of theoretical and epistemological positions” (Ely & Meyerson, 2000a:112). From this point of view, gender is seen as a complex set of social relations enacted across an array of social practices that exist inside and outside formal organisations (Ely & Meyerson, 2000a:113). These social practices tend to reflect and support men’s experiences and life situations because they have been primarily created by and for men (Ely *et al*., 2011:475; Ely & Meyerson, 2000a:113). According to Meyerson and Fletcher (cited by Ely & Meyerson, 2000a:113), change can be effected in organisations by planning an intervention strategy that continuously identifies and disrupts the social order and revises the structural, interactive and interpretive practices in organisations.

The approaches to gender and organisational change discussed above all combine theories of liberal feminism and ‘doing gender’ in organisations, which emerged concurrently and with points of crossover, such as the development of sex role theories (Williamson & Colley, 2018:584). While the feminist theories identify the different types of feminism, the ‘doing gender’ theorists examine how women, men, and organisations create and reinforce gender roles (Abrahamsson, 2014:109–136; West & Zimmerman, 2009:112–122).

Ely and Meyerson (2000a:105–113) evaluate the three traditional approaches to gender and organisational change to examine gender equity and change in organisations. All stem from a liberal feminist framework that pursues equality for women within current institutional structures (Williamson & Colley, 2018:584). Furthermore, Williamson and Colley (2018:585) argue that a new approach beyond liberal feminism and the doing/undoing gender approaches is needed. According to Ferguson (cited by Billing, 1994:181), a radical feminist approach is

required to ensure the restructuring of the bureaucracy, with the removal of hierarchies in favour of consensus and participation.

The theories mentioned above were explored and analysed to determine how they can affect change in organisations to enhance women's position and working conditions in the South African mining industry.

1.3 PROBLEM STATEMENT

From the introduction, orientation and background section, it is evident that with the assistance of various progressive policies and legislations that have been promulgated and implemented over the years, the representation of women in the mining workforce has increased, both globally and nationally (Breytenbach, 2017; MQA, 2023:11; Peltier-Huntley, 2022:1; Tlhatlosi, 2010: ii). This can be seen in countries such as Canada, Australia and South Africa. In South Africa, women's representation in the mining industry has increased from 6% in 2009 to 19.2% in 2023 (DMR, 2009:8; MQA, 2023:11). As highlighted in Section 1, the 2018 Mining Charter set new employment equity targets that must be met by September 2023 (RSA, 2018:22–23).

Even though the numbers of women in mining on a global level have increased since the introduction of equal opportunity and new mining legislations, it is evident that there is still a long way to go in terms of full representation and participation of women at all levels (junior, middle, senior and executive management) in the industry. The underrepresentation of women in the mining industry is attributed to several reasons. Traditional gender hierarchies and norms prevailing in the family and society often depict the roles women and men should fulfil in societies and workplaces (Hare-Mustin, 1988; Naldini, 2017:298–303). Accordingly, women are associated with 'softer' jobs in service industries such as accommodation and food services, retail, education and training (Sharma, 2010:207–208). Women, in general, are more family-oriented than men. Therefore, they often choose female-dominated or neutral occupations or careers that allow them to accommodate family demands and value factors such as flexible work hours, their overall well-being and their role as primary caregivers (Martin & Barnard, 2013:1–2; Zungu, 2013).

As referred to in the Introduction and background section (section 1.1), women are still subjected to poor working conditions in the mining industry and experience several barriers, including gender stereotyping, work–life balance issues, isolation, negative attitudes from male co-workers (Botha, 2017:20; Moraka, 2018:44), a 'glass ceiling' limiting their advancement opportunities in the industry (Botha, 2016:20–21; Moalusi & Jones, 2019), physiological barriers related to their physical capability to perform mine work (Botha, 2017;

Wynn, 2001:33), stress resulting from work-related pressure, tough working conditions, gender discrimination and sexual harassment (Bailey-Kruger, 2012:4; Botha, 2017:20–21; Rubin *et al*., 2017:400–411), and lack of adequate facilities such as insufficient changing and ablution facilities, housing, transport and childcare facilities (Botha, 2017:22–23).

These barriers often indicate why women leave the industry and why mining companies struggle to meet the set targets (Moraka & Jansen van Rensburg, 2015:669; Parliamentary Monitoring Group, 2014). Although strategies were put in place by the DMR (now the Department of Mineral Resources and Energy [DMRE]) to encourage mining companies to make the mining industry more women-friendly, there seems to be a gap between the 'abstract' world and the 'physical' world. Zungu (2013:4) maintains that on paper, the mining environment is gender-neural, but in real life, when women enter this space, there is some animosity and resistance. Lahiri-Dutt and Macintyre (2006:1) further contend that women being discriminated against could be a result of men not seeing women as equal participants~~,~~ but as working-class women with domestic responsibilities. In numerous cases, the mining industry is still an unfriendly environment for women, as men think they still have power and that it is their territory, resulting in women being uncomfortable and feeling like they have to fend for themselves – sometimes causing them to leave mining companies at the first chance they get (Biwa, 2021:43; Le Roux & Naudé, 2009:28). Therefore, mining companies need to pay attention to the working conditions of women workers, specifically those who are employed underground, to create a more favourable working environment for women and to consequently contribute to increasing women's participation in the industry. After increasing women's access to the mining industry, companies need to realise that they still need to go a step further and embrace diversity by transforming the attitudes and behaviours of those who are resistant to change in the company so that the diverse employees, including women, can be fully embraced (Biwa, 2021:43; Le Roux & Naudé, 2009:28).

The effective gender transformation of mining companies requires a deep commitment to gender equality from leadership in companies (Moalusi & Jones, 2019:2). Gender equality is "the state of equal access to resources and opportunities regardless of gender, including economic participation and decision-making; and the state of valuing different behaviours, aspirations and needs equally, regardless of gender" (UNICEF, 2006:1). Furthermore, gender equality "means that women and men, and girls and boys, enjoy the same rights, resources, opportunities and protections. It does not require that girls and boys, or women and men, be the same or be treated exactly alike" (UNICEF, 2006:1).

The problem under investigation can be outlined as follows: Nearly 22 years have passed since the introduction of new mining legislation in 2002. Although considerable progress has

been made in terms of women's representation in the mining industry, the literature reviewed indicated that women are still subjected to poor working conditions in the industry such as workplace safety, discrimination, inadequate facilities, and gender-based barriers. Additionally, little is known about how effectively gender-equity policies are implemented in practice. Accordingly, this study addresses these gaps by exploring the current working conditions of women employed in mining operations at a platinum mine in South Africa and identified the gaps, challenges and limitations.

The study suggests recommendations to address women's working conditions at the platinum mine to effect change in the company so that women can be fully embraced in the organisation and in the mining industry.

1.4 RESEARCH QUESTIONS

Given the problem statement, the general and specific research questions are stated below.

1.4.1 General research questions

The general research question for this study was: What are the current working conditions of women employed in mining operations at a platinum mine in South Africa?

1.4.2 Specific research questions

The specific research questions arising from the general research question are posed below.

Research questions regarding the literature review:

- What existing approaches, perspectives and theories related to gender and organisational change are in existence and how can they contribute to effect change to enhance women's position, in general, and women's working conditions, specifically, in the South African mining industry?
- What are the global and national trends and perspectives relating to women workers in the mining industry?
- Which statutory frameworks (legislation and policies) apply to women working in the South African mining industry?
- What research methodology should be used to explore the working conditions of women employed in mining operations at a platinum mine in South Africa?

Research questions regarding the empirical study:

- What are the working conditions of women employed in mining operations at a platinum mine in South Africa?
- What is the relationship between selected socio-demographic variables and the working conditions of women employed in mining operations at a platinum mine in South Africa?
- What conclusions and recommendations can be drawn from the literature review and empirical results to assist the mining company to effect change and to consequently improve the working conditions of women employed in mining operations at the platinum mine?

1.5 RESEARCH OBJECTIVES

The general and specific research objectives are provided below.

1.5.1 General research objectives

The general objective of this study was to explore the current working conditions of women employed at a platinum mine in South Africa.

1.5.2 Specific research objectives

The specific research objectives emanating from the general objective are posed below.

Research objectives regarding the literature review:

- To analyse the existing approaches, perspectives and theories related to gender and organisational change and to determine how they can contribute to effect change to enhance women's position, in general, and women's working conditions, specifically, in the South African mining industry
- To determine the global and national trends and perspectives relating to women workers in the mining industry
- To analyse the statutory frameworks (legislation and policies) applying to women working in the South African mining industry
- To describe the research methodology that will be used to explore the working conditions of women employed in mining operations at a platinum mine in South Africa.

Research objectives regarding the empirical study:

- To determine the working conditions of women employed in mining operations at a platinum mine in South Africa and to analyse and document the results

- To assess the relationships between selected socio-demographic variables and the working conditions of women employed in mining operations at a platinum mine in South Africa
- To draw up conclusions and recommendations emanating from the literature review and empirical results to assist the mining company to effect change and consequently improve the working conditions of women employed in mining operations at the platinum mine.

1.6 RESEARCH METHODOLOGY

A study's research design and methodology are important, as they act as the framework that regulates how researchers will proceed with conducting their research. In the next section, the facets of the research design and methodology that were followed to conduct the research are discussed.

According to Rajasekar *et al*. (2013:4), research methodology refers to a systematic manner of problem solving; it is, therefore, the science of studying how research ought to be carried out. Furthermore, Rajasekar *et al.* (2013:5) maintain that research methodology refers to the processes and procedures by which researchers describe, explain and predict phenomena. It is also defined as the study of methods by which knowledge is acquired, with the aim of applying this understanding to establish a structured plan.

The research methodology of this study was based on a quantitative research approach. Quantitative research, as characterised by Bryman (2012:160), involves the systematic collection of numerical data and underscores the importance of quantification in both data gathering and analysis processes (Bryman, 2012:35). In addition, it involves following a deductive approach to the relationship between theory and research, wherein existing theories serve as the foundation for study planning and definition (Mouton, 1996:76). Babbie (2010:23, 51) explains that deductive research progresses from the general to the specific, commencing with a theoretical framework from which hypotheses are derived and subsequently tested through empirical observations. However, this study was exploratory in nature, aiming to investigate the factors that affect the working conditions of women employed in mining operations without predetermined hypotheses; instead, theoretical frameworks were used to guide the research questions and data analysis, still employing deductive reasoning, as suggested by Swedberg (2020:17-41).

In this study, deductive reasoning guided the research methodology, primarily through an exhaustive literature review. The aims of conducting the literature review were to examine

theoretical perspectives on the working conditions of women employed in mining operations and to explore global and national trends and viewpoints, as well as the statutory frameworks thereof. The objective was to discern patterns in these constructs, subsequently subjecting them to empirical scrutiny.

Quantitative research operates on principles such as precision, accuracy, measurement, reliability, validity, objectivity, replication, representativeness and generalisability (Sarantakos, 2013:114). Bryman (2012:164) delineates three key rationales behind the emphasis on measurement in quantitative research. First, measurement facilitates the discernment of nuanced differences among individuals concerning the characteristics under study. Second, it furnishes a consistent mechanism for making such distinctions. Lastly, it provides the groundwork for more precise estimations of conceptual relationships, exemplified by correlation analyses (Bryman, 2012:164).

Reliability, as described by Sarantakos (2013:107), assesses the consistency and stability of measurement, thereby evaluating the quality of research instruments. A method is deemed reliable if it consistently yields the same outcomes upon replication, irrespective of researcher identity, research conditions or respondent demographics (Sarantakos, 2013:99). Reliability ensures that the research findings on the working conditions of women in mining are consistent and reproducible across different studies, reinforcing the credibility of the study's conclusions. This study guarantees that responses remain stable across repeated measures by employing structured questionnaires with established reliability metrics. Conversely, validity relates to scrutinising the relevance, accuracy and precision of measurement instruments, ensuring that they effectively gauge the intended constructs (Sarantakos, 2013:107). Validity assessment aid in elucidating whether an instrument accurately measures its intended construct, thereby informing researchers of the instrument's accuracy and precision (Sarantakos, 2013:99). Through rigorous validity assessments, the questionnaire was designed to precisely reflect the realities of women miners, thereby strengthening the study's ability to inform industry policies and gender-equitable workplace reforms.

The study employed a positivist paradigm – a metatheoretical perspective that challenges positivism by recognising the influence of the researcher's theories, hypotheses and values on the observed results (Bergman, 2016:1–5). It promotes objectivity, acknowledges potential biases and accepts both quantitative and qualitative research methodologies, promoting a more inclusive approach (Robson, 2002:624). The positivist paradigm was deemed most suitable for this study because it aligns with the research objective of systematically investigating the working conditions of women in mining operations through quantifiable data. The positivist approach, therefore, provided a robust methodological foundation for evaluating

the systematic barriers women face in the mining industry while ensuring that the study's conclusions are data-driven and generalisable.

The methodology used in this study involved a literature review and an empirical study, which are elaborated on in the sections below.

1.6.1 Literature review

According to Creswell (2009:28), the literature review offers a comprehensive summary of research on a specific topic or problem. This crucial section of any research study aims to provide insights and a thorough understanding of relevant research and debates in a particular area of study (Western Sydney University Library, 2017:2).

A further aim of the literature review is to identify existing knowledge on the topic, assess the validity, and determine potential areas for future research (University of Melbourne, 2013). Furthermore, it can provide direction for the study's design and help the researcher to determine appropriate sampling techniques, sample sizes and data collection methods or instruments that can be employed in the study (Mertens, 2015:91). Having a solid understanding of the literature is essential for any research project, regardless of the research paradigm (Mertens, 2015:91).

In this study, the literature review was used in conjunction with empirical data to address the research questions and objectives. Through a literature review, a theoretical and conceptual framework was developed that focused on approaches and perspectives related to gender and organisational change. The literature review also provided a general overview of women employed in the mining industry, including their working conditions and the factors that affect them. Lastly, the researcher analysed statutory and regulatory frameworks that promote gender equality in the mining industry in South Africa.

The following secondary sources were consulted to conduct the literature review:

- Legislative and regulatory documents
- Journal articles
- Conference papers
- Newspaper articles and press releases
- Theses and dissertations in the field of study
- Books
- Other relevant documents, e.g. scientific reports.

These resources were accessed through the Internet, Ebscohost, e-publications, and journals available in the database of the North-West University (NWU) Ferdinand Postma Library. The following section discusses the empirical investigation.

1.6.2 Empirical investigation

Empirical research or investigation focuses on real-life experiences, rather than a theory based on observed and measured phenomena (Pennsylvania State University, 2018). The subsections below provide details on the research design, sampling method, data collection and data analysis used in the study.

1.6.2.1 Research design

According to Creswell (2014:41), a research design refers to a study's strategy of enquiry. A research design offers an outline for the gathering and analysis of data (Bryman, 2012:46). Research designs are an essential aspect of the research procedure (Sarantakos, 2013:122). The purpose of the research design is to offer guidance to the study process and help rationalise the use of time and resources to lessen expenses (Sarantakos, 2013:121). The research design aims to introduce a methodical approach to the study process, thereby assuring that all the research characteristics are addressed and executed in the correct sequence. Furthermore, Sarantakos (2013:121) maintains that a research design entails openness and accountability for the research process by the researcher. This study followed a cross-sectional research survey design. According to Bryman (2012:58), a cross-sectional design involves gathering data from multiple cases (typically a large number) at a single point in time to obtain quantitative or quantifiable information on two or more variables (often several). This data is then analysed to identify patterns of association.

1.6.2.2 Population and sampling

The research setting was limited to one platinum mine in South Africa; the mine was selected based on availability (convenience sampling).

According to Hanlon and Larget (2011), population refers to the individuals and units that the researcher is interested in studying. Sarantakos (2013:167) states that sampling allows the researcher to study a small part of the target population and obtain data representative of the whole population. Convenience sampling, a type of non-probability sampling, was used to select the respondents. Convenience sampling (also known as availability sampling) refers to research participants who are available to the researcher by virtue of their accessibility (Creswell, 2014:204).

The study's target population comprised women working in mining operations underground or on the surface of the sampled mine. Women who were employed in mining, engineering, geology, chemistry, mine surveying, health and safety, technology, laboratories and supervisory or management roles were included in the survey (i.e. the inclusion criteria). Women employed in administrative and supportive positions such as clerical, secretarial, catering, education, human resource, nursing and health work were excluded from the survey (i.e. the exclusion criteria). A complete survey of the target population was undertaken, but not all women participated in the research, resulting in a non-probability sample. The total number of employees at the mine was 31 940, with women comprising 12.9% of the workforce (MQA, 2024).

When used in quantitative research, convenience samples are often criticised for their lack of assured representativeness. This makes it difficult to estimate population parameters and makes them prone to bias (Frey, 2018:2). As a result, the research findings cannot be generalised to the general population.

While convenience sampling has certain methodological limitations, it can be mitigated by the following measures, according to Frey (2018:2):

- Detailed description of sample demographics. The demographics and characteristics of the sample were documented comprehensively. Variables such as age, racial group, marital status, number of children, qualifications, work shifts, and roles within the mine were included to clearly understand the sample's representativeness compared to the overall population of women employed in mining operations.
- Recruitment of intended respondents. To mitigate response bias and self-selection effects, efforts were made to recruit all eligible participants. Structured questionnaires were distributed to 200 women across three mine shafts, yielding 196 responses, which represents a high engagement rate. The mine's human resource personnel facilitated scheduling interviews during shift changes to ensure greater participation.
- Theoretical relevance of respondents: the inclusion criteria for respondents ensured theoretical relevance by focusing on women directly involved in operational mining roles.

Convenience sampling, despite its inherent limitations, can be helpful in specific contexts of quantitative research. It allows for rapid and cost-effective data collection, making it particularly valuable in exploratory studies or pilot projects where preliminary data is needed to inform more extensive, rigorous studies (Saha, 2024). In time-sensitive research, such as during public health emergencies, convenience sampling enables quick data gathering, which,

although not generalisable, can provide immediate insights for decision-making (Saha, 2024). In addition, it is beneficial when the population of interest is difficult to access, as it allows researchers to collect data from available participants without the logistical complexities of random sampling (Saha, 2024). However, the trade-off is a significant risk of sampling bias, limiting the generalisability of the findings. Therefore, researchers should acknowledge these limitations and use convenience sampling judiciously, ensuring that it aligns with the study's specific goals and constraints. Although the outcome cannot be generalised, it is contended that the findings offer insight into the underlying mechanisms (Mook, cited by Leiner, 2016:371). Because non-probability sampling was used in this study, the size of the sample could not be estimated ahead of time. Despite this, a total of 196 women who were employed in mining operations completed the structured questionnaire (Annexure A). The obtained sample size is comparable to those from previous investigations conducted on women in mining (Botha, 2013 [156]; De Klerk, 2012 [100]; Mangaroo-Pillay, 2018 [165] and Mashaba, 2022 [282]).

1.6.2.3 Data collection

According to Sarantakos (2013:237), data collection entails the operational phase of research. The process begins by arranging the setting to collect research data and explaining the motive of the research to the participants. This study used a structured questionnaire (see Annexure A) to collect the data.

The researcher developed a structured questionnaire with closed- and open-ended questions. According to Babbie and Mouton (2011:233), closed-ended questions are questions that can only be answered by selecting from a limited number of options, usually multiple-choice, 'yes' or 'no', or a rating scale (e.g. from strongly agree to strongly disagree). In contrast, open-ended questions cannot be answered with a simple 'yes' or 'no' and instead require the participants to elaborate on their points.

The structured questionnaire comprised the following eight sections: biographical information, company benefits, company policies, development opportunities, infrastructure facilities, physical proficiency abilities, health and safety considerations, and workplace practices. The biographical questions included the following variables: age, racial group, marital status, number of children, highest qualification, where one works at the mine, the requirement to work night shifts, how long one has been working in the mining environment, level of employment, primary role, and reason for selecting a career in mining. Three-point, four-point, and five-point Likert-type scales were used to measure the respondents' perceptions regarding company benefits, company policies, development opportunities, infrastructure facilities, physical proficiency abilities, health and safety considerations, and workplace

practices. In addition, open-ended questions were included at the end of each section so that the respondents could elaborate further. The items of the scale used were informed by the literature review that identified the factors influencing the working conditions of women employed in mining operations. NWU's Statistical Consultation Services reviewed the questionnaire. The reliability of the scale was measured using Cronbach's alpha and its construct validity using exploratory factor analysis. The results are discussed in detail in chapters Five and Six.

According to Choudhury (2015), questionnaires have the following advantages: they are inexpensive, they permit a wide coverage when the sample population is spread over a large territory, they are practical and provide fast results, and they allow easy analysis of results. Even though questionnaires might be advantageous to use, they also have disadvantages, which include limited and poor responses, lack of personalisation, they cannot fully convey feelings and emotions, lack of validity, their reliability tends to be low, and the participants may misinterpret a question (Choudhury, 2015; Popper, 1959).

1.6.2.4 Data analysis

Data analysis is an essential part of the study process, as the data gathered is raw and perceived as useless unless it is analysed. The Statistical Consultation Services at NWU processed the data and assisted with its analysis and interpretation. The Statistical Package for the Social Sciences (SPSS) version 28 for Windows was used to process the data. These services facilitated the selection and implementation of appropriate and effective data analysis methods for the data collection type. Statistical analysis is a critical component of quantitative research, as it allows for the interpretation and drawing of conclusions from acquired data (Isotalo, 2001:2). According to Ali and Bhaskar (2016:662), statistical analysis breathes life into lifeless data, giving meaning to meaningless numbers. Several statistical analyses were applied in this study, including exploratory factor analysis, descriptive statistics, Spearman's rank-order correlations, t-tests, ANOVAs (analysis of variance) and effect sizes, to analyse the data. A brief description of the methods and techniques used are provided below – a detailed discussion of the quantitative data analysis techniques can be found in chapters Five and Six.

- Exploratory factor analysis

An exploratory factor analysis explored the underlying structure of the following constructs (see Chapter Five, sections 5.6-5.11): development opportunities, infrastructure facilities, physical proficiency abilities, health and safety considerations, workplace practices, and personal information. According to Field (2013:628), factor analysis refers to a technique that

is used to identify groups or clusters of variables. Cronbach's alpha coefficient was used to determine the internal reliability and consistency of the scales used. Cronbach's alpha should be above 0.7 (Eiselen & Uys, 2018:111). According to Field (2013:674–676), Cronbach's alpha largely relies on the number of statements in the factor; therefor the larger the number of statements, the higher the chance of Cronbach's alpha being higher.

- Descriptive statistics

Descriptive statistics form the basis of virtually every quantitative analysis of data and are used to describe the basic features of the data in a study. They provide simple summaries of the sample and the measures (Kothari, 2004:131). Descriptive statistics were reported by indicating the measure of central tendency (mean) and the measure of variability (standard deviation) for each variable. The mean, which is also known as the arithmetic average, "is the most common measure of central tendency and may be defined as the value which we get by dividing the total of the values of various given items in a series by the total number of items" (Kothari, 2004:132). The standard deviation refers to the "square root of the average of squares of deviations, when such deviations for the values of individual items in a series are obtained from the arithmetic average" (Kothari, 2004:135).

- Spearman's rank-order correlations

Spearman's rank-order correlation is a bivariate correlation analysis and measures the strength of association between two variables in a single value between -1 and +1. This value is called the correlation coefficient and indicates either a positive or a negative relationship between the two variables. Spearman's rank-order correlation uses ranks instead of assumptions about the distributions of the two variables and, therefore, does not require continuous-level data (intervals or ratios). It does not assume that the variables are normally distributed and allows for analysing the association between variables of ordinal measurement levels (Statistics Solutions, 2020).

- Independent samples t-tests

Independent samples t-tests were used to compare the means of two independent groups to determine whether there was statistical evidence that the associated population means were significantly different (see Eiselen & Uys, 2018:69).

- ANOVAs

One-way ANOVA tests were used to compare the means of two or more independent groups in order to determine whether there was statistical evidence that the associated population means were significantly different (see Eiselen & Uys, 2018:119).

- Effect sizes

According to Creswell (2014:212), “an effect size identifies the strength of the conclusions about group differences or the relationships among variables in quantitative studies”. It is a descriptive statistic that is not dependent on whether the relationship in the data represents the true population. Creswell (2014:212) furthermore contends that the calculation of effect size varies for different statistical tests. According to Creswell (2014:212), “it can be used to explain the variance between two or more variables or the differences among means for groups”.

1.7 ETHICAL CONSIDERATIONS

Ethics are important for any research study, specifically in research studies where the researcher closely interacts with the participants. To ensure an ethical and professional researcher–participant relationship, the basic ethical standards in social research should be adhered to (Sarantakos, 2013:7). The Basic and Social Sciences Research Ethics Committee (BaSSREC) of the Faculty of Humanities at NWU granted permission to conduct the research (ethics number: NWU-00651-21-A7).

The research study was guided by the ethical principles provided by the BaSSREC, which adheres to the NWU Ethics Policy of the Senate Committee for Research Ethics (NWU, 2018:1). Among other ethical principles, the Ethics Council states that researchers should minimise harm to participants while maximising the benefits of conducting their research. Furthermore, researchers must promote equitable justice (equality) and respect (dignity and autonomy) among the research participants (NWU, 2018:1). Therefore, at the onset of this study, all ethical considerations proposed by the Ethics Council were applied to avoid the violation of the principles. The research study further adhered to the following ethical considerations, as recommended by Babbie and Mouton (2011:320), Bryman (2012:135) and Sarantakos (2013:18):

- Ethical clearance to conduct the study was sought from BaSSREC at NWU.
- Permission to conduct the research was obtained from the platinum mine via writing. The Mining Qualifications Authority (MQA) in South Africa assisted in gaining access to the mine.

- Before conducting the research, written consent was obtained from the research respondents.
- Participation in the research was voluntary; no respondent was forced to participate. The respondents were also informed that they could withdraw at any time.
- The respondents were treated respectfully at all times, and they were not subjected to any harm (physical, psychological or emotional). The research was also conducted in a gender- and culture-sensitive manner.
- The respondents' privacy, anonymity and confidentiality were assured during this research study.

The data collection took place during the Covid-19 pandemic, specifically under lockdown Level 1, and therefore the researcher strictly adhered to the guidelines provided by Higher Health and Universities South Africa (USAf, 2021). These guidelines were crucial for conducting fieldwork safely and ethically during the pandemic. Critical aspects of the fieldwork included the following:

- Advance permission and protocols: Permission to access field locations was obtained in advance. University protocols were communicated beforehand, such as avoiding handshakes, maintaining physical distancing, using hand sanitisers and wearing masks.
- Personal protective equipment (PPE): Adequate PPE was provided for the researcher and any individuals interacted with face to face. This included masks, visors and 70% alcohol-based hand sanitisers.
- Safety toolkit: A comprehensive safety toolkit was prepared, containing items such as masks, visors, sanitisers, disinfectants and informational leaflets on Covid-19 safety practices.
- Transportation and hygiene: Transportation to and from the field was carefully planned, with vehicles and equipment cleaned and disinfected before and after each trip. Gloves were used during cleaning, and hands were sanitised after glove removal.
- Hygiene practices: The researcher practised cough etiquette, frequent handwashing, and regular disinfection of equipment, such as mobile phones, at least twice daily.
- Health monitoring: The researcher did not conduct fieldwork when feeling unwell and engaged in daily self-monitoring for symptoms. If unwell, the researcher would self-isolate and undergo Covid-19 testing.

Ethical considerations were paramount, focusing on treating respondents with respect and dignity, as emphasised by Wilson and MacLean (2011:599). Respondents were referred to respectfully and assured of confidentiality, with information used solely for research purposes.

Ethical concerns also included preventing physical harm and ensuring informed consent. Consent was obtained from the research respondents and mining company using informed consent forms. A debriefing session will be planned after the study to present the results and conclusions to interested respondents. The researcher's ethical responsibilities extended beyond respondent treatment to maintain research integrity. Unethical practices, such as plagiarism, were avoided by presenting accurate results and appropriately crediting sources, as discussed by Gravetter and Forzano (2009:122). These measures ensured that the study was conducted ethically and with integrity.

1.8 MONITORING, STORAGE AND DISSEMINATION OF DATA

1.8.1 Data monitoring

Data monitoring constitutes an essential component in ensuring the accuracy, reliability and integrity of collected data. In this research, questionnaires served as the primary data collection instrument. The questionnaire was structured systematically, with closed-ended questions designed to facilitate efficient data collection and analysis (University of Illinois, 2022). Throughout this process, statistical consultation services provided crucial support by assisting in the design of the questionnaire, ensuring clarity and consistency of the questions and guiding the subsequent data analysis.

Quality assurance measures were implemented to identify and rectify errors or inconsistencies in data collection (University of Illinois, 2022). This phase involved data cleansing and verification of its integrity prior to analysis. Statistical consultants also played a significant role in these quality assurance procedures, contributing to the robustness of the dataset by applying appropriate data validation and error detection techniques.

Furthermore, a comprehensive data monitoring plan was established, delineating roles and responsibilities, determining the frequency of monitoring and outlining procedures for documenting any issues during the study (see University of Illinois, 2022). Statistical consultation services contributed to the development of this plan by providing guidance on best practices for monitoring and documentation, further enhancing the reliability of the data collection process. Adherence to these systematic procedures ensures that the quantitative data collected is sound, ultimately contributing to the validity and rigour of the study's results.

1.8.2 Data storage

The data collected from respondents will be securely stored and archived on NWU servers for a maximum of five years. All data will be acknowledged as the property of the NWU.

1.8.3 Dissemination of data

The outcomes of the study are presented in this dissertation. In addition, the results will be disseminated to the academic community through esteemed academic journals. Following the approval of the final research product, the mining company under investigation will be contacted to arrange a means of communication to share the main results of the research. This is due to the nature of the study being a master's degree and the time it took for the results to be finalised. Consequently, the results will not be available immediately but will be released only after the dissertation has been approved.

1.9 LIMITATIONS OF THE STUDY

It was anticipated that the study would have certain limitations. One of these limitations was gaining access to the mine. To accomplish this, the researcher sought assistance from her contacts at the MQA, who has the contact details of registered mining companies in South Africa. Furthermore, the data was collected during the Covid-19 pandemic and associated lockdowns, which had an impact on the method, timing and duration of data collection. It was also necessary to adhere to strict guidelines when collecting data. The respondents and mines were inaccessible during the data collection period. In addition, mines often have multiple shifts, which made it challenging to schedule in-person questionnaires. To address this issue, appointments were made beforehand to collect data at the change of each shift so that the researcher could meet respondents as they were coming to work or leaving after their shift. This was accomplished with the help of the mine's human resource personnel. The non-probability sampling technique used in the study limits its ability to generalise the results and results to the study's population (women employed in mining operations positions in South Africa). The research setting was limited to one mine; hence, the results may not be generalisable to all women employed in mining operations in the South African mining industry. Therefore, the study's results are only applicable to those who participated in the study.

1.10 THE SIGNIFICANCE OF THE STUDY

The study holds considerable significance for multiple reasons. Given the historical context and the evolving dynamics in the South African mining industry, this investigation is both timely and pivotal. Over 22 years after the introduction of the first Mining Charter in 2004, aimed at transforming the industry and promoting gender diversity, substantial progress has been made in increasing the number of women in mining. However, the journey towards achieving full representation and participation of women at all levels remains ongoing.

The underrepresentation of women in the mining industry can be ascribed to various reasons, with substandard working conditions being a primary issue. These conditions frequently drive women to leave the industry, thereby exacerbating gender disparities. By investigating and prescribing strategies to ameliorate working conditions, this study may help to improve the working conditions of women employed in mining operations and ensure an inclusive work environment for women in the mining industry, promoting their sustained participation in the industry. Enhanced working conditions will bolster job satisfaction and safety for women and foster greater gender parity in the workplace.

This research is set to substantially contribute to the existing knowledge base on women in the South African mining industry. The empirical evidence and insights will enrich the academic discussion on gender representation in mining. The study provides a comprehensive understanding of women's challenges in the industry and the factors that shape their working conditions in mining operations. This, in turn, will equip policymakers, industry leaders and academics with the knowledge needed to develop more effective interventions to foster gender diversity in mining.

Achieving sustainable global economic growth and market efficiency depends on the equitable representation of women in societal economic activities. It is essential for a country's overall economic development that all human resources are optimally utilised and invested in. This study's results emphasise the economic imperatives of gender diversity in mining, reinforcing the importance of inclusive policies and practices that benefit the industry and society.

The conditions under which women work in mining operations in the mining industry are challenging long-held beliefs about gender roles that have traditionally portrayed mining as a work environment unsuitable for women. By demonstrating the feasibility and advantages of women's participation in mining, this study contributes to the larger aim of fostering gender equality in typically male-dominated fields. Including women in the mining industry brings diverse perspectives and is a powerful emblem of progress towards gender equality. Despite various theories and models focusing on gender, organisational change and working conditions of women in mining operations, there are still gaps in understanding gender-specific and industry-related factors. This study aimed to bridge these gaps by applying relevant and existing approaches, perspectives and theories related to gender and organisational change in the mining industry. Furthermore, the study aimed to address the scarcity of literature on this topic, particularly in the South African context, thereby contributing to the academic discourse.

In conclusion, this study aimed to bring about significant improvements in the South African mining industry, particularly in terms of enhancing the working conditions for women and promoting gender representation. By contributing to economic and social development in the region, the study will support efforts to create a more inclusive and equitable mining industry. The research results and recommendations will help enhance knowledge in the field and promote positive change.

1.11 CHAPTER LAYOUT

Chapter One: Introduction, Problem Statement and Research Methodology

This chapter provided the introduction, orientation and background of the study. The chapter also outlined the problem of the study and stated the research objectives, research questions and methodology.

Chapter Two: Feminist thinking on organisational change: a theoretical overview

This chapter presents and discusses the existing approaches, perspectives and theories related to gender and organisational change.

Chapter Three: A historical overview of women employed in the mining industry

This chapter examines the global and national trends and perspectives relating to women's employment in the mining industry across different regions and examines the factors influencing their working conditions.

Chapter Four: The statutory and regulatory frameworks pertaining to women employed in the South African mining industry

This chapter presents and discusses the statutory and regulatory frameworks that govern the South African mining industry's labour workforce, including women.

Chapter Five: Empirical results: socio-demographic information, descriptive statistics, reliability and validity of the variables used

This chapter presents an overview of the study's research methodology and how it was implemented and operationalised. It also presents and discusses the socio-demographic information of the respondents, the descriptive statistics, and the reliability and validity of the variables used in the study.

Chapter Six: Empirical results: inferential statistics, and discussion and interpretation of the results

This chapter presents and discusses the results of the inferential statistics and an interpretation of the study's results in terms of the literature review. Inferential statistics were explored to fully understand the variables influencing the working conditions of women employed in mining operations at the mining company under investigation.

Chapter Seven: Conclusions and recommendations

This chapter draws conclusions and recommendations based on the study's results and literature review.

1.12 CHAPTER SUMMARY

The chapter provided an introduction, orientation and background to the study and presented the problem statement, the research questions and the research objectives. An elaborative discussion of the research methodology adopted followed the research questions and objectives. In addition, the ethical considerations that were implemented were discussed. Moreover, the study was not without limitations, which were highlighted. A discussion of the study's significance was included to demonstrate the necessity of conducting the research. The next chapter discusses the theoretical framework for this study, which speaks to Objective 1 of this study, which is to analyse the existing approaches, perspectives and theories related to gender and organisational change and to determine how they can contribute to effect change to enhance women's position, in general, and women's working conditions, specifically, in the South African mining industry.

CHAPTER TWO

FEMINIST THINKING ON ORGANISATIONAL CHANGE: A THEORETICAL OVERVIEW

2.1 INTRODUCTION

Chapter One provided an introductory overview of the study. The chapter introduced the study and outlined the problem, research questions and objectives, and also set out this study's research methodology. Chapter One demonstrated that even though considerable progress has been made regarding women's representation in the South African mining industry, the industry remains male-dominated. Furthermore, the employment of women in mines remains a challenge, and they continue to face barriers to some extent.

This chapter presents and discusses the theoretical framework for this study, which speaks to Objective 1 of this study, which was to analyse the existing approaches, perspectives and theories related to gender and organisational change and to determine how they can contribute to effect change to enhance women's position, in general, and women's working conditions, specifically, in the South African mining industry. The chapter unfolds in the following way: First, a conceptualisation of the key terms used in the study is provided to create a common understanding of the relevant concepts. Second, a general overview of feminist theory is provided as a theoretical lens to investigate the 'gender problem' in mining companies. Third, feminist approaches to gender equity and organisational change are discussed to create an understanding of the 'gender problem' observed in companies and to determine what can be done to effect change in those companies.

2.2 A CONCEPTUALISATION AND CONTEXTUALISATION OF KEY TERMS USED IN THE STUDY

This section defines and explains the concepts of sex, gender and organisational change, as they are frequently used in this chapter.

2.2.1 Sex and gender

For many decades, the terms 'sex' and 'gender' have been used interchangeably; however, since the early 1900s, social scientists have been documenting sex differences, and sociologists and most other social scientists view sex and gender as conceptually distinct (Connell, 2009:9; Diamond, 2002:321–323).

According to Giddens (1989:158), sex refers to the biological and anatomical differences between women and men. Sex indicates the physical or physiological differences between males and females, including the anatomy of a person (chromosomes, gene expression, hormone levels and function, and the reproductive/sexual anatomy), primary sex characteristics (the reproductive system) and secondary characteristics such as height and muscularity (Annandale & Clark, 1996:19; Diamond, 2002:321; Prince, 2005:29–32; Wiseman & Davidson, 2012:529). Sex is, therefore, usually categorised as female or male, but there is variation in the biological attributes that comprise sex and how those attributes are expressed.

Sociologists make use of terms such as 'sex assignment' or 'sex category' when referring to the concept of sex. These terms describe the method of assigning social meaning to biological sex. Wharton (2009:18–19) explains that sex assignment refers to the process that takes place at birth, or even prenatally, by which individuals are identified as male or female (their sex category) due to their external genitalia. However, this is not always the case; researchers argue that in some live births, the sex differentiation of the infants cannot be easily made. In such cases, "the sex chromosomes, external genitalia, and/or the internal reproductive system do not fit the standard for males or females"; these individuals are called intersexual (Wharton, 2009:19). In addition, Kessler (cited by Wharton, 2009:19) argues that intersexuality is defined as a condition requiring medical intervention called "correctable birth defect". This refers to a distinct difference between the external genitals and the internal genitals. The older term for this condition is 'hermaphroditism' (McGann *et al.*, 2011:156–157; Preves, 2003:43). Furthermore, Prince (2005:29–32) states that in some cases, a person's assigned sex and gender do not align, which results in the perception that the person may be transgender.

The dominant sociological orientation in feminist scholarship is that gender is seen as socially constructed, deriving its meaning from an institutionalised system of social practices (Lorber, 1994; Ridgeway & Correll, 2000). In this view, gender then refers to the socially constructed roles, behaviours, expressions and identities of girls, women, boys, men and gender-diverse people (Mama, 2009:1–5; Wharton, 2009:6). Moreover, Kessler and McKenna (cited by Wharton, 2009:6) maintain that gender is seen as the "psychological, social, and cultural aspects of maleness/masculinity and femaleness/femininity" that are based on biological distinctions. As a result, research has shown that gender influences how people perceive themselves and one another, how they act and interact, and how power and resources in society are distributed (Acker, 2006:444; Mama, 2009:1–5; Wharton, 2009:6).

In addition, gender is a multilevel phenomenon and can be seen as a system. Ridgeway and Smith-Lovin (1999:192) view gender as a "system of social practices" that creates and maintains gender distinctions. Gender is significant in organising relations of inequality, says

Wharton (2009:7), which implies that gender is being continually produced and reproduced. It should therefore not only be seen as a characteristic of people, but that it also takes place on all social structure levels (Wharton, 2009:7). Gender, like other systems of difference, such as race and class, appears in multiple, mutually reinforcing arenas. As a result, these elements of the gender system work to create “the pervasive ordering of human activities, practices, and social structures in terms of the differentiations between women and men” (West & Fenstermaker, 1995:567).

The above definitions indicate that a clear distinction can be made between ‘sex’ and ‘gender’. Sex is hereditary, thereby making it fixed and static. ‘Sex’ refers to the biological or physiological differences between men and women, while ‘gender’ is regarded as a social construct, learned and acquired through the socialisation process from birth onwards, and ascribed to people in different ways. In addition, it refers to social roles and social identities linked to ‘masculinity’ and ‘femininity’. Furthermore, gender is perceived to be different for many societies and refers to what a group considers appropriate for its male and female members. Lastly, gender is seen as progressive and ever-changing; for instance, today, fathers are more involved in the caretaking of children, both men and women wear unisex clothing, women are obtaining and entering jobs that were previously prescribed to men, and men work in the same jobs as women (Lorber & Farrell, 1991:111–117; Mashaba, 2019:21–22; Rothmann, 2011:39–78). The next section defines and explains the concepts of gender equity, equality and inequality.

2.2.2 Gender equity, equality and inequality

The idea of gender equity alludes to “fairness of treatment of women and men, according to their respective needs; this may include equal treatment or treatment that is different, but which is considered equivalent in terms of rights, benefits, obligations, and opportunities” (ILO, 2000). According to Mencarini (2014:1), “gender equity is a more subtle concept that allows for different outcomes for men and women, as long as men and women regard the results as fair, or at least not grossly unfair”. As a result, gender equity is concerned with perceptions of fairness, rather than equality of results. In addition, Mencarini (2014:1) affirms that what is considered fair by gender differs according to context, culture and historical eras. Mencarini (2014:1) further concurs that the cultural-institutional context determines the perception of gender equality and fairness.

Gender equality refers to “the equal participation of both men and women in different life domains (for example, the economy, social life, politics and education)” (Abendroth, 2014:2427). Women’s rights movements linked to the first and second wave of feminism

aimed to establish gender equality as a fundamental human right (Abendroth, 2014). Alternatively, Ridgeway (1997:218–235) contends that gender inequality is a social phenomenon that occurs when men and women are not treated equally. Differences in genetics, psychology or cultural norms may be at the root of the treatment; some of these differences tend to be socially constructed, whereas others appear to be empirically supported (Ridgeway, 1997:218, 235). Furthermore, Ritzer (2008:463) claims that gender inequality, according to liberal feminists, is the outcome of a sexist patterning of the division of labour, and that gender equality can be accomplished by changing the division of labour through the reorganisation of key institutions such as law, work, family, education and the media. Next, the concept of organisational change is defined and contextualised.

2.2.3 Organisational change

Burnes (2004:309) defines organisational change as follows:

> … an ever-present feature of organisational life, both on an operational and strategic level, and it is for this reason that organisations should develop their ability to identify where it needs to be in the future, and the necessary actions it will need to take in managing the changes required to get the organisation safely into the future.

Graetz (cited by Glensor, 2010:11) argues that “organisational change and the management thereof is an essential management skill that is obligatory all over the world where there is increased deregulation, fast technological innovation, a growing knowledge workforce, and ever-changing social and demographic trends”. Organisational change entails ‘tweaking’ the organisation’s strategy and operations, as well as returning to the basics or seeking out new tools and strategies to help the organisation manage the changes ahead (Booysen, 2007:1–20; Nkomo & Kriek, 2011:453–470). In addition, Bennis (cited by Vermaak, 1996:14) defines organisational change as a response to change, a sophisticated educational strategy aimed to change organisations’ beliefs, attitudes, values and structure so that they can better adapt to new technologies, markets and difficulties, as well as the perplexing nature of change itself.

Organisational change has been informed by organisational development theory and practice for many years, which have traditionally been ‘gender-blind’. In organisations, this gender blindness is increasingly under the spotlight of practitioners or change agents who have studied this issue from a gender perspective, such as Anne Marie Goetz, Runa Rao, Rieky Stuart and Michelle Friedman (Plowman, 2000:104). The goal of a gender approach to organisational change, according to Plowman (2000:117), is “to build equitable, efficient, and effective organisations”. Unfortunately, gender is one of several unequal social relations and is interlinked with race and class, among others. According to Plowman (2000:193),

organisational development emanates from a framework in which gender differences are inconsequential. Traditionally, organisational development has been established as an approach for assisting organisations in improving their operations in order to become more effective and efficient (Plowman, 2000:193). Organisational development is therefore "an effort (1) planned, (2) organisation-wide, and (3) managed from the top to (4) increase organisation' s effectiveness and health through (5) planned interventions in the organisation's processes, using behavioural-science knowledge" (Beckhard, 1969:9). The next section explains and contextualises organisational change from a gendered perspective – the focus of this study.

2.2.4 A gendered perspective on organisational change

According to Benschop and Verloo (2011:277), change played a vital role in gender studies. They indicate that the second wave of feminism provided an opportunity to question the position of women and men in society, and the increasing trend of research raised the issue of gender-specific division of labour and advocated for gender equality. Yarwood (2012:2) contends that a gender perspective examines how gender influences people's opportunities, social roles and interactions. Therefore, the successful implementation of policies, programmes and project goals of international and national organisations is directly affected by the impact of gender, which, in turn, also influences the process of social development. Yarwood (2012:2) further states, "gender is an integral component of every aspect of the economic, social, daily and private lives of individuals and societies, and the different roles ascribed by society to men and women." Furthermore, Benschop and Verloo (2011:277; 2015:100–101) argue that although many initiatives and interventions are established to transform organisations into gender-equitable working environments, the change and implementation are slow at best.

According to Benschop and Verloo (2011:278), one can only see the changes towards equality in organisations that have taken place when looking at the organisations from a historical point of view over the past decades. The strategy for gender equality is characterised by continuous innovation, which goes back as far as the establishment of gender equality policies in the 1970s that has influenced the works of scholars to determine "the ideal content and ideal form of the change strategy" (Benschop & Verloo, 2011:278).

Benschop and Verloo (2011:278–279) highlight the two debates that have had an impact on the strategies to accelerate gender change in society and organisations: (a) sameness–difference and (b) structure–agency. The debate on sameness and difference focuses on the question of whether women are the same as or different from men. Proponents of the

sameness perspective argue that patterns of discrimination and prejudice towards women generate any inequalities between the genders. The primary premise of this approach is that there are no significant gender differences (Benschop & Verloo, 2011:279, 2015:100–101; Lewis *et al*., 2017:213–225). More specifically, the underlying argument is that there are no fundamental gender differences in abilities, credentials or work orientations that can explain occupational segregation and salary disparities (Padavic & Reskin, cited by Benschop & Verloo, 2011:279). Benschop and Verloo (2011:279), however, critique the sameness approach, as it overlooks gender disparities based on social identity categories such as race, age and social class, as well as their intersections.

According to proponents of the 'difference' perspective, women have a special contribution to make to work and organisations. Their different experiences, values, characteristics, behaviour, feelings and thoughts provide them with relation skills and qualifications that are much needed in organisations (Fletcher, 2001). In this regard, Benschop and Verloo (2011:278–279) argue that it is practically inefficient, fiscally unwise and a tremendous waste of talent to fail to utilise the full potential of female employees.

The structure and agency debate centres on the topic of whether social inequality is caused by societal structures or by human acts (Benschop & Verloo, 2011:278–279). With regard to organisational change goals, this means that, with a few exceptions, equality plans tend to focus on individuals (agency) or structures. There are three broadly discernible positions on the structure–agency debate. First, Tan (2011:37) claims that some social theorists have proposed a world in which powerful "structures" are dominating and are in charge of orchestrating human behaviour. Emile Durkheim's theoretical work, which emphasises the necessity of "social facts" and laws that shape and govern human behaviour, is the best illustration here. Second, researchers have been eager to emphasise the significance of individual judgements, decisions and acts in social life; in other words, emphasising human "agency". According to this point of view, individuals can plan, define, understand, organise and execute their acts to a significant (or comprehensive) extent (Benschop & Verloo, 2011:278–279; Tan, 2011:37–38). This viewpoint argues that society is the consequence of human creativity, rationality and autonomy; society is a collection of individual actions (and autonomy) (Tan, 2011:37–38). Scholars who have attempted to reconcile both of the above perspectives have taken a third clear position. They have created theoretical frameworks that recognise the dialectical link between "structure" and "agency". In their opinion, both structure and human agency are crucial in the explanation of social existence and organisation. This has been the approach adopted more recently by a number of contemporary social theorists (Tan, 2011:38). The adopted positioning corresponds to the third perspective, which

emphasises the dialectical relationship between structure and agency. Although the view that society is composed of individual actions has merits, it is acknowledged that social structures significantly influence and constrain those actions. Neither perspective adequately reflects the complexity of social existence. Recognising the interplay between individual agency and structural factors provides a more comprehensive understanding of the societal situation. This balanced approach is particularly beneficial in social analysis, as it acknowledges human creativity and rationality while examining the contextual influences of norms, institutions, and historical facts. By adopting this position, emphasis is placed on the dynamic and reciprocal relationship between social relationships and the forces shaping them.

The following section provides an overview of feminist theory.

2.3 AN OVERVIEW OF FEMINIST THEORY

As indicated in the introduction, the 'gender problem' in mining companies was investigated through a theoretical lens of feminist theory and feminist treatments of organisations and change. This section briefly overviews feminist theory and the three waves of feminism. According to Chafetz (cited by Stolley, 2005:26), for a theory to be identified as a "feminist theory, it must recognise gender as a system of inequality, assume that it is a mutable rather than constant or necessary feature of human societies, and support a commitment to a gender-equitable system". Feminist theories argue that "social systems oppress women and that this oppression can and should be eliminated" (Stolley, 2005:26).

According to Ritzer (2008:453), there has always been a kind of feminism and feminist perspective. Ritzer (2008:450) defines feminist theory as a generalised, comprehensive system of ideas and philosophies regarding social life and human experience established from a women-centred point of view. Feminist theory is women-centred in that it explores women's state or circumstances and lived experiences in society (Ritzer, 2008:450). Three distinct phases in the development of feminist thinking can be identified, which are also known as the three waves of feminism; they are briefly elaborated on in the sections below.

2.3.1 First-wave feminism

The first-wave feminism that occurred in the 19th and early 20th century was mainly deep-rooted in the classical liberal thinking that people ought to be allowed to develop and establish their skills and pursue their interests (Drucker, 2018; Macionis, 1995).

This wave of feminism focused on women's fight and struggle for political power and rights, more so their right to vote, and is marked by two key dates in the USA. The first one originated

in 1848, when the first women's rights convention was held at Seneca Falls, New York, and the second one started in 1920, when the 19th Amendment to the United States Constitution granted women voting rights (Krolokke & Sorensen, 2006:3; Ritzer, 2008:453). Furthermore, this wave of feminism aimed to promote equal contract and property rights for women as well as opposing ownership of married women by their husbands (Friedan, cited by Drucker, 2018). According to Anand (2018), women were confined to their households and did not have any control there either. In addition, "single unmarried women were seen as the property of their fathers, and married women the property of their husbands, and they did not have the ability to file for divorce or be granted custody of their children" (Anand, 2018).

According to Krolokke and Sorensen (2006:6), Mary Wollestonecraft's *A vindication of the rights of women* (1792) was one of the earliest manifestations of liberal first-wave feminism in Europe. Simone de Beauvoir's *The second sex* (1949) and Virginia Woolf's *A room of one's own* (1929) were viewed as "central to the canon", "even though both authors were also laying the groundwork for radical second-wave feminism" (Krolokke & Sorensen, 2006:6). Krolokke and Sorensen (2006:6) argue that Virginia Woolf presented the notion of female bisexuality and an exclusive voice for women in her work. Simone de Beauvoir, on the other hand, maintained the existentialist belief in absolute freedom of choice and the consequent responsibility that such freedom entails, by emphasising that one's projects must originate from individual spontaneity and not from an external institution, authority or person (Krolokke & Sorensen, 2006:6). This work produced an authoritative definition of patriarchy.

First-wave feminism did not just focus on the voting rights of women, but also addressed the following goals: access to good employment, equal pay, access to education, the rejection of prostitution and sex trafficking, married women's property rights, a stance on the problem of violence against wives and the right to legal separation and divorce (Rochefort, 2003:483; Walby, 2011:53).

2.3.2 Second-wave feminism

Second-wave feminism arose in the late 1960s and early 1970s and focused on issues of equality and discrimination (Ritzer, 2008:451–453). Drucker (2018) states that the second-wave slogan, "The Personal is Political", identified women's cultural and political inequalities as inseparably related; it encouraged women to comprehend and understand how their personal lives reflected and reproduced sexist power structures. According to Evans (1995:13), early second-wave feminism was a feminism of two forms of equality. The first form began with the Presidential Commission of 1960, which was organised in February 1960 as a non-official body. The second form of equality emerged from the 1960s' New Left, which

campaigned for a broad range of social issues such as civil and political rights, feminism, gay rights, abortion rights, gender roles and drug policy reforms.

The release of Simone de Beauvoir's work *The second sex* in France in 1949 marked the start of second-wave feminism, and in this work, men are seen as the first sex, while women are always seen as the second. According to Lorber (2010:3), the actors are men, and they determine the standards and values, while the women are the reactors, and they lack the characteristics that the dominants (men) possess.

The concept that sexual inequity is an inherent and unchanging part of life was rejected by second-wave feminists. In addition, they distinguished between sexual difference, which they saw as based in nature, and gender difference, which they saw as socially constructed (Bilton *et al*., 2002:490). Second-wave feminism aimed to address, among other things, political, economic and social inequality and was characterised by the following specific theories: liberal feminism, radical feminism, and Marxist and socialist feminism.

Liberal feminism. According to Benschop and Verloo (2015:101), liberal feminism is one of the most influential strands of feminism in management and organisation studies. Rooted in political philosophy, the notion of liberalism embraces the core idea of individual liberty as a political value. Liberal feminism is characterised by its focus on achieving gender equality through political and legal reform within the framework of liberal democracy (Ritzer, 2008:463). Furthermore, Haralambos and Holborn (2008:102) contend that liberal feminists push for progressive change in Western cultures' political, economic and social structures; rather than revolutionary change, they desire reform within the current social structure, which they attempt to achieve through a democratic system. Liberal feminists advocate for the abolition of discrimination, sexism and stereotypical perceptions of women and men. For example, they advocate for equal educational and economic possibilities, as well as equal responsibility for family activities, the removal of sexist messaging in homes, schools and the media (Ritzer, 2008:466). Lastly, liberal feminists aim to address issues such as workplace discrimination, sexual harassment and equal pay for equal effort, among other things. They attempt to do this by introducing law, i.e. legislation, litigation and regulation, as well as fairness arguments (Haralambos & Holborn, 2008:102).

Radical feminism. According to Haralambos and Holborn (2008:101), radical feminism seeks to eliminate patriarchy, also known as the 'rule by the father', to liberate everyone from an unjust society by challenging existing social norms and institutions. This struggle includes opposing the sexual objectification of women and raising public awareness about issues such as rape and violence against them (Haralambos & Holborn, 2008:101). A radical feminist

movement emerged during the second wave of feminism, with the goal of investigating reasons for female oppression. Radical feminists specifically look into issues of power and inequality, such as unequal pay, workplace discrimination, domestic violence, rape and other forms of subordination and assault that disproportionately affect women. In Bilton *et al.*'s. (2002:490) opinion, this generation of feminists links women's subordination to the way society is organised and argues that reforming society would fix the problem.

Marxist and socialist feminism. Marxist and socialist feminism is a philosophical variant of feminism that incorporates and extends Marxist theory. These types of feminism analyse how women are exploited through capitalism and the individual ownership of private property (Ritzer, 2008:472). According to Tong (2007:23–39), Marxist feminists, on the one hand, believe that women's oppression, whether proletarian or bourgeois, is a product of the political, social and economic systems connected with capitalism, rather than the wilful actions of people. Socialist feminism, on the other hand, is connected to Marxist political philosophy through key notions such as social reproduction, domination, exploitation and oppression (Benschop & Verloo, 2015:103). Calás and Smircich (cited by Benschop & Verloo, 2015:103) argue that, unlike Marxist feminism, the "socialist feminist philosophy stresses that the system of capitalism alone does not sufficiently explain the persistence of gender inequalities and calls for critical attention to the relation between capitalism and patriarchy as related structures of domination". Marxist feminism advocates for radical change and believes that the establishment of a communist society could accomplish it. These feminists believe that all gender inequalities will disappear in a communist society (Haralambos & Holborn, 2008:102). Socialist feminists advocate for change by creating global solidarity among women to combat abuse caused by capitalism in their lives, their communities and their environment (Ritzer, 2008:477).

2.3.3 Third-wave feminism

Third-wave feminism aims to describe and explain feminist ideas of the generation of women who will live their adult life in the 21st century. Feminists in this wave recognise that gender is socially constructed and is therefore sustained by the notion of 'doing gender' and challenged by 'not doing gender'; therefore, the concepts 'women' and 'gender' are central to this feminist viewpoint (Ritzer, 2008:453). According to Friedan (cited by Drucker, 2018), this philosophy seeks to challenge the meaning of femininity, which grew out of the ideas and thoughts of second-wave feminism. Third-wave feminists consider themselves as capable, strong and assertive social agents (Baumgardner & Richards, 2000:83). Friedan (cited by Drucker, 2018) maintains that the third wave of feminism sees women's lives as "intersectional, demonstrating how race, ethnicity, class, religion, gender, and nationality are all significant factors when

discussing feminism". This way of thinking contends that there are many genders, sexualities and sexes and also numerous approaches to express masculinity and femininity. Lorber (2010:4) contends that the focus is placed on how we do gender and how, in the process, we have assembled an inconsistent social order. Third-wave feminism, therefore, examines issues related to women's lives on a global basis.

In Krolokke and Sorensen's (2006:16) opinion, the third wave of feminism is inspired by the need to create a feminist theory and politics that honour opposing encounters and deconstruct categorical thinking. Krolokke and Sorensen (2006:19) further assert that the third wave is occupied with impacts on globalisation and the intricate redistribution of power, mirroring the enhancement of women's interests and points of view and the breakdown of expert accounts of oppression and freedom. For example, postcolonial third-wave feminism is concerned with creating a new critical global point of view for black, diasporic and subaltern feminisms, while queer theory and political movements create a platform for lesbian, gay, bi- and transsexual and transgender movements.

Snyder (2008:175) maintains that third-wave feminism creates three very significant strategic moves that respond to a series of theoretical problems within the second wave. First, in its response to the collapse of the category of "women", the third wave focuses on personal narratives that illustrate an intersectional and multi-perspectival version of feminism. Second, because of the rise of postmodernism, third-wave feminists "embrace multivocality, over synthesis and action over theoretical justification". Third, in response to the disruptiveness of the sex wars, third-wave feminism highlights an inclusive and non-judgemental approach that refuses to police the boundaries of the feminist political (Snyder, 2008:175).

Third-wave feminism is characterised by poststructuralist and postmodern theories such as Black feminism and postmodern feminism. These two types of feminism share some similarities, such as the fact that they both reject the possibility that a single theory can explain the position of women in society and see various perspectives as similarly legitimate (Haralambos & Holborn, 2008:116).

Black feminism. The black feminist tradition grows not out of other movements, but out of the condition of being both black and a woman. It is a long tradition that resists easy definition and is characterised by its multi-dimensional approach to liberation (Brewer, 1989:57). Black feminism contributes by making the intersectionality of gender, race and ethnic class visible (Lorber, 2010:197). It is therefore believed that black feminism has influenced postmodern feminism.

Postmodern feminism. Tong (cited by Haralambos and Holborn, 2008:118) claims that postmodern feminism encourages knowledge and acceptance of differences, including those between men and women, masculine and feminine, and different types of masculinity and femininity. Moreover, postmodern feminism tends to challenge the possibility that some characteristics are to be accepted by others; this is because postmodern feminists reject earlier feminists' sex/gender distinction and claim that culture generates the category of "women" by ascribing value to specific physical patterns. Subsequently, postmodern feminists occasionally reject the possibility that women can progress by taking on the characteristics and acquiring the social positions customarily reserved for men (Haralambos & Holborn, 2008:116). This is because "gender inequalities are embedded in a multidimensional structure of relationships between women and men, which, as the modern sociology of gender shows, operates at every level of human experience, from economic arrangements, culture, and the state to interpersonal relationships and individual emotions" (Connell, 2005:363).

2.3.4 Conclusion

From the previous discussion it is evident that feminist theories contributed meaningfully to accomplishing greater equality in society and the work environment around the world. In addition, feminist theories aim to explain and give additional solutions to persisting inequities in societies and workplaces. First-wave feminism advocated for equal legal rights for women, which included suffrage (the right to vote), as well as addressing a wide scope of objectives that focused on opening up opportunities for women, including access to education and good jobs.

Second-wave feminism was centred around gender inequality. This wave of feminism aimed to establish a gender balance in an unequal society. It also focused on expanding women's legal rights, political representation as well as access to jobs and occupations dominated by men. The women in this feminism wave attempted to accomplish equal opportunities in education and medical care.

Third-wave feminism emerged in the 1990s and is now also part of the 21st century. Feminists in this wave acknowledge that gender is socially constructed and is therefore sustained by the notion of 'doing gender' and challenged by 'not doing gender'. These feminists continue to focus on numerous sources of inequality such as race and social class. The section below outlines and discusses the feminist approaches to gender equity and organisational change.

2.4 FEMINIST APPROACHES TO GENDER EQUITY AND ORGANISATIONAL CHANGE

Over the past decade, feminist theorists have made important contributions to the study of organisations by offering critiques of accepted management principles and articulating how organisation theory and practice are systematically prejudiced against women (Acker, 1990:140; Meyerson & Kolb, 2000:553). Ely and Meyerson (2000b:104) argue that the reason for this critique and for the large number of organisational efforts to recruit and advance women is that the advancement of women in the workplace has been gradual and mainly limited to white women. Those who have advanced have frequently done so by assimilating into predominantly male organisations. There is substantial evidence that neither sex roles nor gender norms and relations within society have evolved significantly, limiting the extent and types of changes that can occur at work (Ely & Meyerson, 2000b:104). In addition, the reason that women remain relatively powerless at work is that organisations fail to question and change prevailing notions about what constitutes the most appropriate and effective ways to define and accomplish work, recognise and reward competence, and understand and interpret behaviour (Ely & Meyerson, 2000b:104). Furthermore, Ely and Meyerson (2000b:104–105) contend that these unquestioned work practices support the deeply entrenched divisions and disparities between men and women, often in subtle and insidious ways. The burgeoning literature on feminist theory and feminist treatments of organisations proposes a variety of ways to categorise different approaches to gender and the 'gender problem' in organisations (Calas & Smircich, 1996:212–213; Ely & Meyerson, 2000b:105).

According to Acker and Van Houten (cited by Acker, 2012:214), theories regarding gender and organisations began in the late 1960s and early 1970s when feminist scholars criticised conventional organisational research as insufficient, as it disregards the importance of gender in working life. Scholars have done a great deal of research on gender processes in organisations, and new concepts were created from these scholars' research, which included 'gender' and 'gendering', and increased knowledge concerning the manner in which gender inequalities are produced and reproduced (Acker, 2012:214).

Joan Acker's (1990) ground-breaking article, "Hierarchies, jobs, bodies: a theory of gendered organisations", argued that organisational structures are not gender-neutral and that this fact is commonly masked or obscured through gender-neutral, asexual discourse (De Vries, 2010:11). When one says that an organisation is gendered, it means that "advantage and disadvantage, exploitation and control, action and emotion, meaning and identity, are

patterned through and in terms of a distinction between male and female and masculine and feminine" (De Vries, 2010:11).

Acker (1990:140) maintains that the images of men's bodies and masculinity pervade organisational processes, disregarding women and contributing to the maintenance of gender segregation in organisations. The idea of a "gender-neutral" organisation is part of the larger control strategy in industrial capitalist societies, which, at least partly, are built upon a deeply embedded substructure of gender difference. According to Acker (1990:140), a need arose for a systematic theory of gender and organisations for the following reasons. The first reason is the gender segregation of work, including divisions between paid and unpaid work, which is somewhat created through organisational practices. The second reason is related to gender segregation, income and status inequality between women and men, which is also partially created in organisational processes. Understanding these processes is necessary for understanding gender inequality. The third reason is that organisations are considered one arena in which widely disseminated cultural images of gender are invented and reproduced, while the fourth reason is that some aspects of individual gender identity, for example masculinity, are also products of organisational processes and pressures. Finally, an important feminist project is to make large-scale organisations more democratic and more supportive of humane goals.

For organisations interested in addressing the issue of gender equity comprehensively and sustainably, Kolb *et al.* (1998:10) offer a comparative framework that illustrates why most approaches to gender equity are partial solutions and do not achieve lasting gains. Drawing on existing frameworks that compare theoretical perspectives on gender in the workplace, Kolb *et al*. (1998:10) propose four frames through which to understand gender equity and organisational change. These four frames consist of three traditional approaches and a non-traditional approach (see Table 2.1). The fourth frame, a non-traditional approach to gender equity and change, is an integrated perspective that acknowledges the complex role gender plays in organisational life, which can be used to understand the 'gender problem' in organisations. The framework suggests different strategies that could be followed to enhance gender equity and foster change in organisations. The four frames in the framework are based on different conceptions of gender, different visions of what gender equality is and different ideas about what strategies should be used for achieving that vision (Peterson, 2019:3). Table 2.1 outlines the four frames to gender equity and change as suggested by Kolb *et al*. (1998) and tabulated by Ely and Meyerson (2000b).

Table 2. 1: Approaches to gender equity and change

Approaches to gender equity and change						
Frames	**Definition of gender**	**Problem definition**	**Vision of gender equity**	**Approach to change**	**Benefits**	**Limitations**
Frame 1: Fix the women	Socialised sex differences	Women lack skills and know-how to play the game	No differences between men and women; women are just like men	Develop women's skills through training, mentoring, etc.	Helps individual women succeed; creates role models when they succeed	Leaves system and male standards intact; blames women as source of problem
Frame 2: Value the feminine	Socialised sex differences ; separate spheres of activity	Women's skills are neither valued nor recognised	Differences recognised, valued and preserved	Diversity training; reward and celebrate differences and 'women's ways'	Legitimates differences; 'feminine' approach is valued; tied to broader diversity initiatives	Reinforces stereotypes; leaves processes in place that produce differences
Frame 3: Create equal opportunities	Sex differences in treatment, access and opportunity	Differential structures of power and opportunity yield less access and fewer resources for women	Create a level playing field by reducing structural barriers and biases	Policies to compensate for structural barriers, e.g. affirmative action, and work and family benefits	Helps with recruiting, retaining and advancing women; eases work–family stress	Has minimal impact on organisational culture; backlash; work–family remains 'woman's problem'
Frame 4: Assess and revise the work culture	System of oppressive relations reproduced in and by social practices	Social practices designed by and for white, heterosexual, class-privileged men appear neutral, but uphold gender as fixed, ranked oppositions	Process of identifying and revising oppressive social practices; gender is no longer an axis of power	Emergent, localised process of incremental change involving critique, narrative revision and experimentation	Exposes apparent neutrality of practices as oppressive; more likely to change organisational culture; continuous process of learning	Resistance to deep change; difficult to sustain

Source: Ely and Meyerson (2000b:106–107)

2.4.1 Frame 1: Fix the women

The first, most popular and common approach to gender equity and change, named “fix the women” (Ely & Meyerson, 2000b:105) or “equip the women” (Meyerson & Kolb, 2000:560), rests on a liberal and individualistic vision of society and organisations (Kolb *et al*., 1998:10).

Definition of gender. From this point of view, gender is synonymous with biological sex and the difference between men and women is the result of their sex role socialisation/socialised sex differences (Meyerson & Kolb, 2000:560). Sex role socialisation produces individual differences in attitudes and behaviours between men and women, which have rendered women less skilled than men to compete in the world of business. These socialised differences account for inequalities between men and women in the workplace (Ely & Meyerson, 2000b:560; Peterson, 2019:3; Williamson & Colley, 2018:584).

Problem definition. Proponents of this approach believe that women have lagged behind men in their achievements because they lack the kinds of socialisation experiences to develop the traits and skills required for success (Fletcher & Ely, 1977:3), which resulted in women’s deficits (Meyerson & Kolb, 2000: 560). Seemingly, if women developed appropriate traits and skills, they would be better equipped to compete with men. They would advance at rates comparable to men and would assume a proportionate share of leadership positions (Ely & Meyerson, 2000b:105–106). Organisational interventions designed to eliminate sex inequality would eradicate socialised differences; this could be done by strengthening women’s skills to give them the platform, as individuals, to perform on par with men, thereby making women the sole targets of such efforts (Ely & Meyerson, 2000b:106). The actions developed within this kind of theoretical framework only target women and intend to empower women and strengthen their position in the organisation by equipping them with appropriate skills, competence and networks (Peterson, 2019:3). Women are therefore supposed to learn how to compete with men and “play the game better” (Ely & Meyerson, 2000b:107).

Vision of gender equity. Ely and Meyerson (2000b:106–107) maintain that the vision of gender equity is that there are “no differences between men and women; women are just like men”. Therefore, this approach tries to minimise gender differences so that women can compete on an equal footing with men (Kolb *et al.*, 1998:11).

Approach to change. Women’s skills should be developed through training and mentoring. According to Kolb *et al*. (1998:11), educating and training more women for business and professional careers is key to easing the difficulties organisations have had recruiting them into positions traditionally held by men. These efforts will produce an enhanced applicant pool

and create a pipeline of qualified women to fill these positions (Ely & Meyerson, 2000b:107). According to Hennig and Jardim (1977), “executive training programs, leadership development courses, networking workshops, and assertiveness training programs that focus on helping women develop the skills and styles considered requisite for success are representative of this approach”. The problems and solutions within this frame rest with the individual woman; she must acquire the skills she needs (Meyerson & Kolb, 2000:560–561). However, Meyerson and Kolb (2000:561) and Peterson (2019:3) maintain that although many women have learned valuable skills in these programmes, resulting in some moving into middle and senior management positions, the glass ceiling remains (Meyerson & Kolb, 2000:561; Peterson, 2019:3).

***Benefits*.** According to Ely and Meyerson (2000b:106), this approach benefits individual women by helping them succeed and creating opportunities for them to become role models for other women.

Limitations. Peterson (2019:3) states that this approach is limited, as it does not challenge existing structures and the system that benefits men. Furthermore, Ely and Meyerson (2000b:108) indicate that the interventions recommended in this frame purposely leave existing organisational policies and structures intact and are meant to assimilate (some) women with minimal disruption to the status quo. Ely and Meyerson (2000b:108) further argue that the limited and sometimes negative impact of these interventions is due largely to this fact. According to Thomas and Ely (cited by Ely & Meyerson, 2000b:108), unless change efforts challenge existing power arrangements in organisations, people from traditionally underrepresented groups will remain marginalised in tenuous and often untenable positions.

2.4.2 Frame 2: Value the feminine

The second approach is called ‘value the feminine’ (Ely & Meyerson 2000b:108) or ‘value difference’ (Meyerson & Kolb, 2000:561). The second frame is nearly the opposite of the first. Its proponents argue that socialised differences between men and women should not be eliminated, but celebrated and valued (Kolb *et al*., 1998:11; Williamson & Colley, 2018:584).

Definition of gender. This approach conceptualises gender as socialised differences between men and women, embodied in different masculine and feminine styles or ‘ways of being’. Masculine and feminine identities are seen to be shaped by different life experiences and social roles (Kolb *et al*., 1998:11).

Problem definition. From this approach, women are disadvantaged, as work styles, skills and traits associated with ‘the feminine’ are not recognised or rewarded in the workplace

(Helgesen, 1990:119–125). Fletcher (cited by Ely & Meyerson, 2000b:109) argues that because organisations place a higher value on behaviours, styles and forms of work traditionally associated with men, masculinity and the public sphere of work, and devalue, suppress or otherwise ignore those traditionally associated with women, femininity and the private sphere of home and family, women have been disadvantaged.

Vision of gender equity. Peterson (2019:3) states that within this approach, the problem with gender inequality is accredited to the lack of rewards for specifically women's skills. Therefore, the route to gender equity is to recognise, value and preserve gender differences (Ely & Meyerson, 2000b:106).

Approach to change. This approach suggests interventions focused on consciousness-raising and training to help people recognise the distinct styles, skills, and viewpoints of women and men (Ely & Meyerson, 2000b:109–110). The goal is to emphasise how activities typically associated with femininity – such as active listening, collaboration, nurturing, and discreet conflict resolution – have been undervalued in professional settings, while also illustrating the positive impact (Ely & Meyerson, 2000b:109–110; Peterson, 2019:3).

Benefits. According to Ely and Meyerson (2000b:106), this approach legitimates the differences between men and women, values the 'feminine' approach and emphasises the broader diversity and awareness initiatives.

Limitations. Peterson (2019:3) argues that this approach is limited, as it may reinforce stereotypes portraying women as 'different'. Additionally, it overlooks the issues of oppression and diversity among women themselves and does not address the organisational processes that create these differences.

2.4.3 Frame 3: Create equal opportunities

The third approach, 'create equal opportunities', focuses on structural barriers to women's recruitment and advancement (Ely & Meyerson, 2000b:110).

Definition of gender. From this perspective, gender is still framed as differences between men and women; however, these differences result not from socialisation processes, but from differential structures of opportunity and power that block women's access and advancement (Ely & Meyerson, 2000b:110–111).

Problem definition. The problem in this frame is rooted in the structures of power in organisations and the unfair opportunity practices and resource allocation for women (Ely & Meyerson, 2000b:106). Kanter (1987:37–53) refers to this as differential structures of

opportunity, which create a sloped playing field. Kanter (1987:37–53) suggests that gender inequities are the result of biased hiring, evaluation and promotion processes which, in turn, result in gender segregation of occupations and workplaces.

Vision of gender equity. Ely and Meyerson (2000b:106) state that this approach can achieve gender equity by creating an equal playing field for both men and women and reducing structural barriers and biases.

Approach to change. Acker and Van Houten (cited by Ely & Meyerson, 2000b:12) suggest that interventions designed within this frame should be mainly policy-based. This approach aims to create equal opportunity for women and men by abolishing structural and procedural barriers to women's success and advancement (Meyerson & Kolb, 2000:561–562). Legislation and organisational policies are the primary forms of intervention in this frame. They comprise several familiar remedies, such as affirmative action policies and revised recruiting procedures designed to bring more women into previously male-dominated jobs, more transparent promotion policies to ensure fairness (Acker & Van Houten, 1974), sexual harassment policies, mentoring programmes (Kram, 1986), alternative career paths (Schwartz, 1989) and the provision of work and family benefits, such as childcare and flexible work arrangements (Bailyn, 1993). These latter policies recognise that an important structural barrier for women is their caretaking responsibilities outside of work (Meyerson & Kolb, 2000:562). These policy-based programmes should be designed to eliminate or compensate for structural barriers that make it more difficult for women to compete with men (Ely & Meyerson, 2000b:12).

Benefits. The abovementioned interventions assist with the recruitment, retention and advancement of women, which in turn eases their work–family stress (Ely & Meyerson, 2000b:106).

Limitations. Peterson (2019:3) maintains that the limitations of this approach include "the danger that, for example, work-life balance is understood as a 'women's problem' without challenging organisational cultures" and "although a flexible work policy might be in place, people might not take advantage of it, and those who do might see detrimental effects on their career opportunities". The interventions, according to Ely and Meyerson (2000b:113), do not manage to disrupt "the pervasive and deeply entrenched imbalance of power in the social relations between men and women".

2.4.4 Frame 4: Assess and revise the work culture

The fourth approach to gender equity and organisational change is 'assess and revise the work culture'. According to Ely and Meyerson (2000b:110), a new approach is needed, one

that goes beyond liberal feminism and the doing/undoing gender approaches. The fourth approach is a “post-equity” approach that involves resisting and revising the dominant discourse (i.e. revision of the work culture) and goes beyond liberal feminism and the doing/undoing gender approaches (Peterson, 2019:4; Williamson & Colley, 2018:585). While the first three frames have a common focus on women, the fourth frame shifts this focus from women to structural and organisational aspects that reproduce gender inequity (Ely & Meyerson 2000b:113). This approach draws on a theoretical framework that identifies how supposedly gender-neutral social practices reproduce a system of oppressive relations in organisations that privilege men (Peterson, 2019:4).

According to De Vries (2010:18), women are a frequent theme in frames 1, 2 and 3, and all three frames offer patchwork solutions that fail to address the underlying causes of organisational inequality. De Vries (2010:19) argues that in contrast with the first three frames, the fourth frame focuses on the underlying and systemic elements in workplaces that lead to workplace inequality, rather than on women. Furthermore, Ely and Meyerson (2000b:590) state that organisations are perceived as upholding a gendered social order in which men and varied types of masculinity predominate, rather than individuals. As stated by Ely and Meyerson (2000a:9), a Frame 4 intervention would continuously identify and undermine that social order, revising organisational structural, interaction and interpretive processes accordingly. De Vries (2010:20) states that the fourth frame is an experimental process rather than a destination. Applying Frame 4 is a discovery process, as each organisation is unique and no pattern for the transformation is necessary. The details of Frame 4 are outlined below.

2.4.4.1 Definition of gender

Frame 4 is distinguished by its conception of gender and its grounding in different theoretical and epistemological positions (Ely & Meyerson, 2000b:113). From this perspective, gender is neither an individual characteristic nor simply a basis for discrimination; rather, it is a complex set of social relations enacted across a range of social practices that exist both within and outside of formal organisations (Ely & Meyerson, 2000b:113; Fletcher & Ely, 1977:5–6). Focus is placed on social practices, ranging from formal policies and procedures to informal patterns of everyday social interaction in formal organisations. These social practices tend to reflect and support men’s experiences and life situations, because they have been created largely by and for men (Acker, 1990; West & Zimmerman, 2009). These social practices, however, maintain a gendered social order in which men and particular forms of masculinity predominate because they grow out of the conditions that characterise men’s lives (Ely & Meyerson, 2000b:113).

2.4.4.2 Defining the problem of gender inequity

According to Ely and Meyerson (2000b:114–115), traditional concepts of male and female, masculine and feminine, as permanent categories defined by a sequence of putatively natural, hierarchically ranked oppositions are at the basis of the problem of gender imbalance from the fourth frame perspective. The prototypical white, Western, heterosexual male experience, in contrast with the prototypical white, Western, heterosexual female experience, defines these oppositions in Western organisations (Ely & Meyerson, 2000b:115). These oppositions include terms such as public–private, individualism–collectivism, reason–emotion, mind–body and competition–cooperation. Ely and Meyerson (2000b:115) contend that the first term in each of the hierarchically ranked oppositions is regarded as a universal feature of maleness and is more highly valued and generously rewarded than its opposite term, which is regarded as a universal feature of femaleness. Ely and Meyerson (2000b:114–115) argue that although the particular content of the hierarchically ranked oppositions appears to be culture- and history-specific, their oppositional, hierarchical structure appears to remain universal, with men and masculinity, however defined, in the privileged position.

Frame 4 indicates that "the representation of gender as oppositions both originates in and preserves male privilege" (Ely & Meyerson, 2000b:115). Flax (cited by Ely & Meyerson, 2000b:115) argues that its universal truth status obscures the interests it serves and reinforces the notion that organisational and social frameworks are gender neutral. At the core of this conception of gender is the idea that work exists as a public domain where certain men, specifically those who are white, heterosexual, Western, and class-privileged, and their associated forms of masculinity are seen as "naturally" dominant (Ely & Meyerson, 2000b:115). As a result, many workplace social practices unquestionably favour these men, often subtly and covertly. The first three frames fail to notice this, leaving these more subtle and insidious forms of injustice unaffected.

The social practices of a workplace consist of policies and procedures, for example work rules, employment contracts, managerial directives, job descriptions and performance appraisal systems. They additionally incorporate informal practices, standards and patterns of work. Furthermore, Bailyn (cited by Ely & Meyerson, 2000b:115) indicate that a large number of these practices implicitly or explicitly place a higher value on the prototypical male, manly personality, or masculine experience. In addition, Ely and Meyerson (2000b:115) maintain that job descriptions for positions of power and authority that call for masculine-gendered attributes are an illustration of a system in oppressively gendered organisations.

Ely and Meyerson (2000b:116) state that narratives and the social interactions within which people construct and convey them can also take oppressive forms and play an important part in the gendering process in organisations. This idea is founded on our knowledge of reality as socially produced, sustained and updated, largely through the stories organisation members tell about specific people or events and their overall perceptions of what is happening in the organisations. However, Ely and Meyerson (2000b:116) argue that these narratives frequently represent real people in specific situations or address concrete issues of current concern. Therefore, these narratives encapsulate general worldviews that, when followed, encompass what is "true, right, and good'" (Ely & Meyerson, 2000b:116). As a result, these common understandings are frequently ignored, unacknowledged and unchallenged.

According to Ely and Meyerson (2000b:117), these types of workplace social practices function collectively and covertly to sustain male dominance by categorising behaviour and assigning meaning as superior (man, masculine) or inferior (female, feminine) while maintaining the appearance of gender neutrality. The differential valuing associated with other identity-based distinctions, such as ethnicity, class and sexual identity, which anoint specific men and determine the particular types of masculinity that dominate, is also implicit in these social practices. Reskin and Padavic (1994) additionally contend that these social practices create systematic distinctions between and among men and women, depending in part on their ability and willingness to conform to the dominant cultural images these practices uphold – distinctions that serve to justify disparities in the material conditions of their lives. As a result, these social practices restrict and limit chances not only for women, but also for many men. Furthermore, Ely and Meyerson (2000b:117) state that identifying these social practices and documenting their effects on women's and men's experiences form the basis of an analysis of gender inequity.

The section below then first discusses the social practices that produce gender-based problems and inequity in organisations, and second, the social practices that maintain the gender status quo in organisations.

2.4.4.2.1 Social practices that produce gender-based problems and inequity in organisations

According to Ely and Meyerson (2000b:118), certain social actions and practices create gender-based inequities in organisations. Ely and Meyerson (2000b:118) identified three of the most prevalent themes (see Table 2.2) in Western society and culture and describe how each is implicated across a range of social practices, often with ramifications for both gender

parity and organisational effectiveness. These themes are introduced into organisations from the society in the form of a male–female dichotomy.

Table 2. 2: Gendered themes, social practices and outcomes that produce gender-based problems and inequity in organisations

Gendered themes, social practices and outcomes that produce gender-based problems and inequity in organisations			
Gendered theme	**Examples of social practices**	**Gendered outcomes**	**Unintended organisational consequences**
Theme 1: **Public–private dichotomy**	Narratives of ideal worker as one able to put work first; crisis-oriented work patterns; norms intended to maintain illusion of workplace as asexual	Women, who carry disproportionate responsibility for dependent care, are perceived as less committed; obfuscates sexuality as dimension of heterosexual male power	Perpetuates inefficient use of time; encourages crises; little time for planning and reflection; rewards behaviour that may not be associated with competence or task
Theme 2: **Individualism–collectivism dichotomy**	Narratives, images that portray competence as heroic individualism; rewards for producing immediate, visible results; lack of recognition and rewards for collaborative, developmental (i.e. 'relational') work	Heroic individualism associated with men/ masculinity; 'relational' activities associated with women/femininity; differential rewards for men and women performing heroic and 'relational' activities	Allows heroes to create roles for themselves that may be unnecessary or irrelevant to business demands; discourages developing others and planning and building systems and infrastructure
Theme 3: **Male identity–female identity dichotomy**	Narratives that portray men and women as fixed, stereotyped opposites; evaluations and perceptions that invoke sex stereotypes and penalise people when they fail to uphold them	Women do not fit masculine image, so do not fit model of success; women are ignored or devalued when they behave stereotypically feminine and denigrated when they behave stereotypically masculine	Relies on narrow set of criteria for model of success and who fits it; suppresses broader range of styles and approaches that could inform and enhance work; increases dissatisfaction and turnover among those who do not 'fit'

Source: Ely & Meyerson (2000b:119)

Theme 1: Public–private

According to Bailyn (cited by Ely & Meyerson, 2000b:118), the most common gender issue in modern organisations is the division between the public and private spheres of activity and knowledge. It is argued that this division between the two spheres constructs and affirms the concept of a sexual division of labour, in which the ability of men to perform specific jobs in

the public sphere is naturally complemented by the capability of women to manage expressed aspects of family life, such as household responsibilities including cooking, cleaning and taking care of the children in the private sphere (Berdahl *et al.*, 2018:429; Ely & Meyerson, 2000b:118, 2010:3-4; Mogorosi, 2007:511–512).

Furthermore, it is argued that the idealised images of workers and parents are based on idealised images of manhood, which is acquired through their status of being a provider, and the idealised images of womanhood, which is acquired through their status of being a mother (Acker, 1990; Ely & Meyerson, 2000b:118; Mogorosi, 2007:511–512). Therefore, Acker (1990) states that "as many have observed, the concepts of 'worker' and 'man' are inextricably bound, as are the concepts of 'parent' and 'woman', a condition that is both reflected in and sustained by the structure and culture of most workplaces". Rapoport *et al.* (cited by Ely & Meyerson, 2000b:118) contend that organisations reflect on the public–private theme using narratives and images that best describe the ideal workers as people who are willing to put work first and are capable of doing so, transcending all other commitments and activities in life.

Various of seemingly gender-neutral social practices aids in upholding this image of the perfect employee. These consist of crisis-oriented work patterns and chaotic and disruptive work routines, which makes it hard to plan or bound time commitments and demand that people be perpetually present at work and available and accessible to affect unexpected events and the consequences thereof (Ely & Meyerson, 2000b:118, 2010:3–4; Mogorosi, 2007:511–512). Ely and Meyerson (2000b:120) further argue that even though these social practices are seemingly gender-neutral in that everybody is similarly exposed to them, they punish individuals who are not always constantly accessible for work and thereby differentially affect women and men. This is because women tend to bear disproportionate responsibility for home and family. Women, on average, have less flexibility to work the long hours many companies require without feeling they are abdicating responsibility on the home front; therefore, women appear to be less committed and are more likely to be unavailable when needed (Ely & Meyerson, 2000b:120; Ely & Thomas, 2001:229–273).

As previous studies suggested, the issues that arise for women with the public–private split concern time and the allocation thereof between work and family (Ely & Meyerson, 2000b:120). This is how white, middle- and upper-middle-class women experience the issue most noticeably and intensely. However, race and class oppression and issues can also increase in an additive manner, which then leads to more burdens for women of colour (Acker, 1990:195–206; Ely & Meyerson, 2000b:120; Fletcher & Ely, 1977:3–9). This is because race and class oppression interrelate with gender to deliver various subjective and qualitative encounters and experiences of the public–private split in organisations. When analysed

through the lived conditions of women from other races, ethnics and social classes, the indications of the conservative divide of public and private spheres become more perplexing and multi-layered (Ely & Meyerson, 2000a:590–592, 2000b:120). It is, in addition, very critical to recognise how race and class oppression interact with gender to produce qualitatively different encounters of the public–private split in organisations. When examined through the lives and circumstances of women of other racial, ethnic or social class backgrounds, the manifestations of the traditional separation of public and private spheres become more complex and multifaceted (Ely & Meyerson, 2000a:120, 2010:3–4); Mogorosi, 2007:511–512).

Theme 2: Individualism–collectivism

According to Gergen (cited by Ely & Meyerson, 2000b:123), the second gender issue in Western organisations is the tension between individualism and collectivism, in which individualism always prevails. LeFebvre and Franke (2013:129–146) argue that the debate between individualism and collectivism centers on the fundamental basis of political ideology. While we may all concur on those values, for example equity and opportunity are essential goals for society, how these qualities are to be achieved relies upon whether we accept that the crucial unit of society is the individual or the gathering (LeFebvre & Franke, 2013:129–146). Individualism refers to the degree to which people of society identify their self-image as an individual or as a member of a broader community; collectivism, on the other side, refers to persons who identify themselves via the social and collective parts of their self-concept (LeFebvre & Franke, 2013:133). It is based on a belief in individual success and a meritocratic system of reward and stratification (Domina, 2009:109; Ely & Meyerson, 2000b:123–124).

In numerous organisations, the individualism–collectivism theme is most noticeable in narratives and pictures that depict competence and capability as heroic autonomy (Ely & Meyerson, 2000b:124). This is supported and reinforced by a range of policies, informal practices and working patterns (Ely & Meyerson, 2000b:124). Fletcher (cited by Ely & Meyerson, 2000b:124) states that “in organisations with these social practices, collaboration, teamwork, capacity building, smoothing difficulties, and developing others is often invisible work”. Narratives about success and failure that commend individuals for resolving crises and tackling urgent organisational issues serve to reinforce the belief that individuals will succeed or fail based solely on their own abilities and merits (Ely & Meyerson, 2000b:124).

Ely and Meyerson (2000b:124) further argue that “practices that differentially value individual heroics and collaborative building activities can lead to gender inequities because these domains are gendered”. Heroic activities are associated with the attributes that people connect with masculinity in Western cultures, such as strength, assertiveness, independence, self-

sufficiency and risk-taking (Ely & Meyerson, 2000b:124; Ely & Padavic, 2007:1121–1143). On the other hand, building habits are often associated with femininity; they are collaborative, consultative, inclusive, non-hierarchical, supporting and relationship-focused (Ely & Meyerson, 2000b:124). Although there is growing recognition within Western management circles of the value of traditionally feminine characteristics, and some organisations actively appreciate these traits, activities focused on collaboration and relationship building are often overlooked or subtly discouraged, particularly in environments that emphasise heroic behaviour. This is especially true, as some have noted, when women are the ones engaging in these practices (Ely & Meyerson, 2000b:124). This may be because actions and interactions that involve team building, developing people's skills and working behind the scenes to achieve team success are seen as 'natural' behaviour for women and are therefore not considered a developed competency when women do them (Domina, 2009:109; Ely & Meyerson, 2000b:124, 2010:3–4).

Theme 3: Male identity–female identity

The third issue concerns the contrast between male and female identity, as the categories of exclusion fixed and rooted in the biological categories of sex are probably deterministic (Ely & Kimmel, 2018:628–630; Ely & Meyerson, 2000b:126). Ridgeway (cited by Ely & Meyerson, 2000b:126) argues that a woman is defined by what her opposite, a man, is not; according to this contrast, each person has only one gender and is never the other or both. The dual and oppositional reason that underpins this understanding of gender identity derives from and perpetuates the assumption that there is a true essence of femaleness embodied within all women and a genuine essence of maleness embodied within all men (Berdahl *et al.*, 2018:422; Ely & Meyerson, 2000b:126). This theme often emerges in sex differences, evoking narrow and idealised images of men and women as single categories distinguished by a variety of stereotypes. In Western organisations, these idealised images are those linked to white, Western and heterosexual men and women (Ely, 1995:589–634; Ely & Kimmel, 2018:628–630). The assumption of fixed differences between men and women characterises most gender discussion in organisations, whether the goal is to diminish sex differences, ignore them, reject them or praise them (Ely & Meyerson, 2000b:126; Kolb, 2019:185–189).

These representations pervade a wide range of organisational social practices, such as performance evaluations, success and failure attributions, and behaviour interpretations informed by fixed, stereotypical assumptions about men's and women's capabilities and deficiencies (Ely & Meyerson, 2000b:126). They also include practices that punish or criticise people for failing to uphold gender norms, such as unfavourable images of women who are

perceived to be extremely aggressive and men who are perceived to be overly sensitive (Ely & Kimmel, 2018:628–630; Ely & Meyerson, 2000b:126).

These social practices perpetuate traditional sex and gender roles and behaviours, whether implicitly or explicitly. They reflect, in particular, expectations and criteria for success that are blended with conventional images of white, Western, heterosexual masculinity and are understood as opposed to conventional images of white, Western, heterosexual femininity (Ely & Meyerson, 2000b:126; Hehenberger *et al*., 2013:1673). Therefore, Brenner *et al*. (cited by Ely & Meyerson, 2000b:126) maintain that women do not fit the operative model of success in many firms if for no other reason than they are in bodies that do not fit this masculine image. As a result, "when women fail to meet performance expectations based on masculine images of competence, their failures are construed as stereotype-confirming"; they are less likely than their male counterparts to be given the benefit of the doubt and consequently have less slack within which they can manoeuvre to achieve their goals (Ely & Meyerson, 2000b:126). Simultaneously, when women align with more positive feminine stereotypes, such as working in construction, they are not praised, because feminine skills are often overlooked or undervalued (Ely & Meyerson, 2000b:126–127; Kolb, 2019:185–189).

The nature and consequences of these activities, like those emerging from the public–private and individualistic–collectivistic divisions, are affected by other dimensions of identity. Not just women~~,~~ but also some men suffer as a result of social practices that foster conformance to white, Western, heterosexual conceptions of masculinity (Ely, 1995:589–634; Ely & Kimmel, 2018:628-63). For instance, men's efforts in~~to~~ traditionally feminine occupations are frequently lauded, but only for those who have already proven their manhood (Ely & Kimmel, 2018:628–630). This suggests that men who fail to conform to the conventional image of heterosexual masculinity may have less latitude to deviate from that image. Furthermore, not all women are affected by these practices in the same way or to the same extent. Ely and Meyerson (2000b:127) state that women of colour and working-class or poor women who deviate from the idealised – white, middle- and upper-middle-class – image of femininity will likely face different outcomes, depending in part on how their race, ethnicity, religion, class and other factors shape stereotypes about them, including sex stereotypes.

2.4.4.2.2 Social practices that maintain the gender status quo

Ely and Meyerson (2000b:129) contend that there are social practices that disguise the gendered nature of other social practices. It is primarily narratives – iconic representations, often communicated through language – that people rely on to understand what is going on around them. These include narratives about gender, as well as capacities and deficiencies,

commitment and lack of commitment, successes and failures, which lead to gender discrimination or reinforcement of gender themes, whether explicitly or implicitly (De Oliveira & Dambrun, 2007:101–104; Ely & Meyerson, 2000a:509–515; Schwabenland *et al.*, 2016:388). Members of the organisation take these narratives, as well as the specific set of assumptions, preferences and interests on which they are based, for granted, and they are then conceptualised and perceived as 'objective' and independent. Hence, they function to accept 'the way things are' in organisations and serve as powerful but generally unseen legitimating techniques (Ely & Meyerson, 2000b:129).

Although narratives are the most common form of institutionalised social practices that function in this way, other types of institutionalised social practices can also serve as legitimising devices by preventing discussion of alternatives to widely held beliefs about how things are (Ely & Meyerson, 2000b:129). For example, training programmes for women that indirectly and hardly outline the organisation's gender problems as attributable to women's skill deficits can preclude consideration of other explanations, such as the gendered nature of the organisation's practices (De Vries, 2010:7–54; Ely & Meyerson, 2000b:129). Ely and Meyerson (2000b:131) once again state that, like the other social practices discussed above, those that obscure the gender identity of different practices can also compromise organisational effectiveness and potentially restrict organisational learning capabilities.

Ely and Meyerson (2000b:131) maintain that narratives are particularly pernicious perpetrators because their neutralising and legitimising roles are hidden, safeguarding as 'truth' ideas that may otherwise be susceptible to dispute. As a result, to the extent that narratives disguise organisations' gendered nature, they also complicate how gendered practices undermine equity and effectiveness aims (Ely & Meyerson, 2000b:131).

2.4.4.3 Vision of gender equity

According to Pavlic *et al.* (2000:5), gender equity means "fairness of treatment for men and women according to their respective needs. This may include equal treatment or treatment that is different but considered equivalent regarding rights, benefits, obligations, and opportunities".

According to Ely and Meyerson (2000b:131–132), the vision of gender equity results from the understanding of gender and its role in organisational life and is a process through which organisational members continue to identify and disrupt oppressiveness in the organisation, including the gendered social practices in organisations, and revise them accordingly. In addition, Ely and Meyerson (2000b:132) point out that this process aims to find and enact the

vision of work and social interaction that is less restricted by gender and other oppressive roles, images and relations. It starts when members of an organisation learn to question their own and others' assumptions about roles, work and effectiveness, including the elements that make up the success of individuals and organisations (Ely & Meyerson, 2000b:132; Fletcher & Ely, 1977:4–7; Williamson & Colley, 2018:584–585). As a result, the way work is defined, assigned, executed and evaluated changes. Ely and Meyerson (2000b:132) believe that by challenging and redefining what it means to be male or female, masculine or feminine, the process of contemplation, learning and transformation will eventually transform the organisation, its members and their relationships. This process will unveil other, more fluid ideas of identity and social organisation by breaking down the strong oppositions typically linked with gender. According to Ely and Meyerson (2000b:132), this strategy aims to oppose and eventually eradicate gender as a power axis.

Ely and Meyerson (2000b:132), influenced by the work of scholars such as Bailyn *et al*. (1997), Kolb and Merrill-Sands (1999), Merrill-Sands *et al*. (1999) and Thomas and Ely (1996), argue that their objective extends beyond gender equality. They believe ~~that~~ achieving gender equity goals can often benefit the organisation's operational goals. This is because many of the same factors that promote gender inequity also sabotage an organisation's effectiveness (Ely & Meyerson, 2000b:132; Williamson & Colley, 2018:584–585). Intervening in these processes led to the realisation that most social practices in an organisation are firmly rooted in the ideas and values that have long been accepted as 'the way things are'; that organisation members believe they are not only gender-neutral but also sensible business practices (Ely & Meyerson, 2000b:132; Peterson, 2019:3–4). Ely and Meyerson (2000b:132) believe that the type of questioning and inquiry they advocate will disclose the truth. A gender analysis from this perspective might also point to methods to improve the organisation's effectiveness.

2.4.4.4 Approach to change

According to Ely and Meyerson (2000b:132), the gender analysis and vision of gender equity point to the need for nothing less than revolutionary organisational reform. Other scholars have called for a complete, radical restructuring of organisations to advance feminist ideas at work based on their analyses of the gendered character of organisations, which are similar to what Ely and Meyerson (2000b:132) propose. Ely and Meyerson (2000b:133) advocate for a radical restructuring of organisations; however, theirs is an emergent, partial and gradual process of incremental change. Meyerson and Scully (1995:585) state that with this approach, any one intervention is a kind of resistance, not intended to modify the organisation's gender relations on its own, but to transform the organisation through a sequence of interventions, each designed to disrupt existing gender arrangements.

Intervention strategies include continuously identifying and disrupting the social order and, consequently, revising the structural, interactive and interpretive practices in organisations (Meyerson & Fletcher, 2000). There is no identifiable endpoint of this approach. Kolb *et al*. (1998:14) maintain that gender equity interventions from this frame's viewpoint engage with basic work practices and procedures and the norms that motivate them to revise them in less gendered ways that are more effective for the organisation. The goal of interventions within this approach is for organisational members to challenge and transform the sense of what it means to be male or female, masculine or feminine (Ely & Meyerson, 2000b:113–114). Williamson and Colley (2018:585) further maintain that this fourth approach to organisational analysis and change proposes a framework that 'disrupts' gender through systemic workplace interventions in which workplace participants critique gendered organisational practices and reflect on and experiment with new ways of working. This disruption of gendering in organisations, according to Benschop and Verloo (2011:285–287), needs to include a shared understanding of what 'gender equality' means and long-term and short-term plans for change, with feedback loops, active involvement of all parties and experimentation. Peterson (2019:4) argues that the limitation of this approach is organisational resistance when such deep change of organisational culture is the goal. Ely and Meyerson (2000b:133) believe that if change is carried out as part of a single global change effort, it will be politically and pragmatically difficult, if not impossible, to initiate and sustain. The section below outlines the three phases of revising organisational narratives to effect change in organisations (Ely & Meyerson, 2000b:135–141).

Phase 1: Critique

The organisation's critique is this phase of the change effort. According to Ely and Meyerson (2000b:135), the critique aims to find oppressively gendered social behaviours in the organisation, particularly those that appear to jeopardise its effectiveness.

Ely and Meyerson (2000b:137) suggest three criteria for examining the gendered nature of an organisation's social practices during the critique phase. First, determine the extent to which social practices may have a differential impact on (a) men and women, (b) different women's groups and (c) different men's groups. Second, consider whether any social practices are applied differently to men and women, different groups of women and different groups of men. Third, the team must determine whether social practices, particularly narratives, use the facade of neutrality to conceal the repressive nature of other social practices.

Phase 2: Narrative revision

The second phase of the approach is revising and rewriting the organisation's narratives. Narrative revision begins during the critique. One of the key goals of narrative revision and critique is to disrupt existing narratives with new narratives that contradict popular perceptions of the organisation's gender neutrality (Ely & Meyerson, 2000a:509–592, 2000b:137; Meyerson & Scully, 1995:585; Williamson & Colley, 2018:585).

Gender exclusion from narratives about how people work and how organisations are run reflects and contributes to the mainstream societal belief that gender is irrelevant. Ewick and Silbey (cited by Ely & Meyerson, 2000b:138) refer to these narratives as hegemonic narratives. According to Bohm (cited by Lombardo, 2010:265), "the hegemonic discourse *(narrative)* is one that attempts to legitimise a particular narrative over all others". During this phase, the organisations should provide the "alternatives to the standard explanations for women's relative lack of success by systematically linking individual women's seemingly idiosyncratic experiences to the cultural, political, and social patterns of life within the organisation" (Ely & Meyerson, 2000b:138).

Ely and Meyerson (2000b:138) maintain that feedback retrieved from this phase might feel frightening because it questions many firmly held assumptions about the neutrality of institutionalised social procedures and the rationality of the organisation's current mode of operation. As a result, many people will likely resist it. Indeed, the practice of feeding back criticism to organisation members is intended to bring to light and name hidden issues that many people would want to remain hidden (Ely & Meyerson, 2000b:138; Kolb *et al*., 1998:4–7). Therefore, Gadlin (cited by Ely & Meyerson, 2000b:138) indicates that the feedback process does not generate these conflicts; rather, it just exposes what was already present so the organisation can learn and adjust. Furthermore, just as revealing suppressed disputes can have a negative impact on members of the majority, failing to do so can have a negative impact on individuals who have been the brunt of them, as well as the organisation as a whole (Ely & Meyerson, 2000b:138; Williamson & Colley, 2018:584–585). Therefore, the narrative review is an ongoing activity throughout the transformation process and, in fact, is a key aspect of the next phase (Ely & Meyerson, 2000b:137).

Phase 3: Experimentation

The third phase of the method includes experimenting with changes to the definition, operation and evaluation of the working methods. This may include any changes in social practices that Ely and Meyerson (2000b:139) identified above, ranging from formal policies and procedures to informal daily social interaction patterns.

It is important to call for these interventions ‘experiments’ for various reasons (Ely & Meyerson, 2000b:139–140). First, people usually have weak resistance to the concept of ‘experiment’, and they may see it as a temporary test rather than a permanent change. Second, it arouses people’s attention to these efforts, because it destroys the status quo and deviates from the institutionalisation of ‘normal’ things. Finally, an ‘experiment’ evokes the image of a test, and, in the spirit of action research, the interventions envisioned serve as tests of the validity of the analysis that suggested them. According to Ely and Meyerson (2000b:140), a one-off experiment does not provide a solution to organisational problems. Instead, there is the possibility of change in a series of experiments, each aiming to change a set of social practices that express and maintain asymmetric gender relations. Therefore, it is important that any experiment is a ‘perfect’ intervention (Ely & Meyerson, 2000b:140; Meyerson & Scully, 1995:585; Williamson & Colley, 2018:585).

2.4.4.5 Benefits of the approach

According to Ely and Meyerson (2000b:107), this approach “exposes apparent neutrality of practices as oppressive; and is more likely to change organisation culture; and makes provision for the continuous process of learning in the organisation”. The purpose of interventions in this approach is for members of the organisation to question and change their perceptions of what it means to be male or female, masculine or feminine (Ely & Meyerson 2000b:113–141).

2.4.4.6 Limitations

According to Peterson (2019:4), “the limitation of this fourth approach is organisational resistance when a change of organisational culture is the goal”. Meyerson and Kolb (2000) state that this is an approach with a more complex and comprehensive perspective on gender, understanding organisations as inherently gendered. Furthermore, De Vries (2010:24) states that a Frame 4 approach gets to the heart of how organisations sustain the current status quo by ‘doing gender’. Combining gender equity with other corporate goals might be troublesome, putting the long-term objective at risk.

2.4.5 Conclusion

From the above discussion, it is evident that over the years, the feminist approaches have advocated for gender equity and organisational change and have contributed meaningfully to accomplishing greater equality in the work environment all around the world. Kolb *et al*. (1998:10) provide four frames through which gender equity and organisational change can be comprehended. These four frames consist of three traditional approaches and a non-

traditional approach, namely Frame 1: Fix the women, Frame 2: Value the feminine, Frame 3: Create equal opportunities, and Frame 4: Assess and revise the work culture. The fourth frame, a non-traditional approach to gender equity and change, is an integrated perspective that recognises the multifaceted role of gender in organisational life and can be utilised to explain the 'gender problem' in organisations. The framework proposes various ways to improve gender equity and encourage organisational change. The framework's four approaches are founded on different concepts of gender, different ideals of gender equality and different beliefs about achieving that vision.

2.5 CHAPTER SUMMARY

This chapter provided the theoretical framework for this study. First, a conceptualisation of the key terms used in the study was done to create a common understanding of the concepts used in this study. The following concepts were defined and explained: sex and gender; gender equity, equality and inequality; organisational change; and a gendered perspective on organisational change.

Second, an overview of feminist theory was provided, as the gender issue in mining companies was investigated through a theoretical lens of feminist theory and feminist treatments of organisations and change. The three distinct waves in the development of feminist thinking were discussed, as were the different theories associated with each phase. First-wave feminism aimed to obtain and secure equal legal rights for women, especially voting rights. This wave of feminism also addressed a wide range of goals, such as married women's property rights, equal pay, access to education and good jobs, and the legal right to separation and divorce. Second-wave feminism advocated for political, economic and social equality, thereby aiming to create a gender balance in an unequal social structure. Third-wave feminism recognised and highlighted how gender is socially constructed and maintained through 'doing gender' and weakened by 'not doing gender'. This wave of feminism continues to focus on multiple sources of inequality, such as race, ethnicity and social class. Feminist theories significantly enriched the literature review by offering explanations for persistent inequalities, both in society and the workplace, as well as proposing solutions to promote gender equality globally in these spheres.

Third, feminist approaches to gender equity and organisational change were discussed to create an understanding of the 'gender problem' in organisations and to determine what can be done to effect change in organisations. The four frames identified by Kolb *et al.* (1998:10) to understand gender equity and organisational change were elaborated on: Frame 1: Fix the women, assumes that women are less well-equipped than men to compete for positions, while

Frame 2: Value the feminine, emphasises the need to recognise and value women's contribution. The approach is also used to increase gender equality and is sometimes expressed in terms of a 'business case' for gender equality. Frame 3: Create equal opportunities entails identifying the problem with power structures that limit women's access to valuable resources. Policy changes within this approach can benefit women's career development, especially at entry and middle management levels. Lastly, Frame 4: Assess and revise the work culture, offers a more comprehensive perspective on gender in organisations. The goal of interventions within this approach is for organisational employees and managers to challenge and transform the sense of what it means to be male or female, masculine or feminine.

The following chapter provides a historical overview of women employed in the mining industry globally and nationally. It presents and discusses the historical context of women's involvement in mining, their working conditions and the challenges they experience in their employment.

CHAPTER THREE

A HISTORICAL OVERVIEW OF WOMEN EMPLOYED IN THE MINING INDUSTRY

3.1 INTRODUCTION

The previous chapter provided the theoretical framework for this study, drawing from feminist theory and feminist approaches to gender equity and organisational change, which were employed to investigate and understand the 'gender problem' in mining companies.

This chapter is structured into four sections, providing a comprehensive overview of women's employment in the mining industry across different regions and examining the factors influencing their working conditions. This exploration aligns with the Objective 2 of this study, which was to determine the global and national trends and perspectives related to women workers in the mining industry. The second section provides a global overview of women in mining in Australia, Brazil, Canada and the UK. The third section focuses on women employed in mining in Africa – in Ghana, Rwanda and Zimbabwe. The literature reviewed provides a historical context of women's involvement in mining and the challenges experienced in their employment in these countries. The countries examined were chosen based on the availability of literature. These countries' mining industries are essential to their economies and contribute to employment opportunities. All statistics presented were retrieved from the most recent publicly available information. The fourth section elaborates on the participation and integration of women in the South African mining industry. The fifth section discusses the factors affecting the working conditions of women employed in the mining industry, as documented globally.

3.2 A GLOBAL OVERVIEW OF WOMEN EMPLOYED IN THE MINING INDUSTRY

The mining industry has historically been considered masculine due to its male-dominated workforce and physical nature, even though women have worked there for centuries (Botha & Cronjé, 2015b:659). Currently, the percentage of women employed in the mining industry globally is less than 14% (ICMM, 2023). The underrepresentation of women in the mining industry results from historical legislation, policies and traditional social practices and customs (Kljajevic, 2015:45). The ILO adopted the Underground Work (Women) Convention 45 of 1935 on 21 June 1935, which came into force on 30 May 1937. Article 2 of this Convention prohibited women's employment in underground mining; however, several countries that

initially ratified it have since renounced it (Chamber of Mines of South Africa, 2017:1; ILO, 1935). Among these countries are Australia (1988), Canada (1978), Chile (1997) and South Africa (1996) (Chamber of Mines of South Africa, 2017:1). While the ILO Convention 45 of 1935 was revised, it played a significant role in global labour standards. For some countries, mainly European countries, the Convention was the only template available; this contributed to the perpetuation of gender inequality in the mining industry among women (Eiter *et al*., 2023:388; Lahiri-Dutt, 2019:5, 2020a:389).

In the past, the patriarchal system was held accountable for perpetuating the view that women were unsuitable for mining occupations and defining what was acceptable or unacceptable for women to pursue (Sultana, 2010:10). This led to women working in non-core positions, such as administration, human resources, finance and cleaning (Botha, 2013:180; Heine, 2008:13; Mashaba, 2022:83). The patriarchal system oppressed women in social, political and economic terms (Moyo, 2011:67; Sultana, 2010:10). Consequently, men and women subordinated women in the workplace and their respective communities because of unequal relationships (Lahiri-Dutt & Macintyre, 2006; Mashaba, 2022:83). In recent years, the mining industry has become increasingly aware of the need to achieve gender parity and include women holistically (ILO, 2021b:14). Furthermore, Sustainable Development Goal 5 aims to achieve gender equality, empowers all women and girls, and recommends women's full participation in all economic industries, including mining, to ensure that societies remain healthy and prosperous (United Nations, 2015:16).

The section below elaborates on the involvement of women in the mining industries in Australia, Brazil, Canada and the UK. The countries selected for this discussion were carefully chosen based on extensive research on the rich history of women in mining and their tireless efforts to achieve full participation in this industry over the years. The data used for the statistics is the most up-to-date and reliable information available. Each country's overview covers the following topics:

- Overview of the mining industry
- Legislative framework
- Women's representation and participation in the industry
- Challenges women face in the mining industry
- Initiatives to promote women's participation and empowerment in the mining industry.

3.2.1 Australia

This section contextualises the mining industry in Australia and elaborates on women's representation.

Overview of the mining industry. Australia has a strong, globally competitive mining industry. The country is ranked among the top five global producers of gold, bauxite, iron ore, rare earth, mineral sand, zinc, nickel and coal (Britt *et al*., 2021:1). From the gold rush of the 1850s to the mid-2000s hydraulic fracturing era, Australia's economic development has primarily relied on its ability to excavate and extract natural resources for export (AusIMM, 2022b; Helbert, 2018:231).

Regarding economic contribution, the mining industry remains Australia's most significant industry, accounting for approximately 13.7% of the country's gross domestic product (GDP) in 2022 (International Trade Administration, 2024). In addition, women constitute 16% of the mining workforce in Australia, reflecting ongoing efforts towards gender diversity in the industry (Australian Government's Workplace Gender Equality Agency, 2023). The industry's resilience further contributes to investor confidence in its long-term finances (Casey, 2021).

The impact of the Covid-19 pandemic on Australia's mining industry was relatively minor compared to other industries. Although some operations experienced temporary suspensions or scaled-back activities due to health and safety measures, the industry's isolated working environments and their classification as essential allowed for continued operations (Casey, 2021). Consequently, mining has sustained its status as Australia's largest industry and a cornerstone of stability and profitability during the pandemic (Casey, 2021).

Legislative framework. Historically, Australian legislation has prohibited women from working underground in mines. Men were deemed ideal workers with no other domestic obligations and responsibilities (Kljajevic, 2015:15). The Mine Regulations Act of 1964 and the Tasmanian Mine Inspection Act of 1968 explicitly barred women from underground mining roles unless specifically authorised by the Chief Inspector of Mines (Quinlan & Walters, 2020:31–58). Similarly, the Mines Inspection Act of 1901 restricted women from underground work, permitting them only in non-physical roles that did not require physical labour, such as management and healthcare (Quinlan & Walters, 2020:31–58). Consequently, women predominantly engaged in traditional roles and conventional feminine professions such as teaching and nursing (Helbert, 2018:233).

Before the 1970s, women's employment in mining was virtually non-existent, with operators facing fines for employing them. The industry began to open its doors to women in the early

1970s, influenced by various factors, including women's movement campaigns against the sex-segregated labour force, governmental promotion of equal job possibilities and the fight against gender discrimination, which contributed to women's permeation in the industry (Abrahamsson *et al*., 2014:13; Australian Mining Review, 2018). Educated young women were attracted to the industry and recognised opportunities for stable salaries, travel and meaningful careers that transcend traditional gender roles (Australian Mining Review, 2018).

The Equal Opportunity Act, enacted on 20 December 1984 and effective on 1 March 1986, marked a significant legislative milestone. This Act provides equitable opportunities for women while protecting them from workplace hazards such as abuse and behaviour that could impede their productivity (Du Plessis, 2016:652–665). It prohibits discrimination based on age, sex, sexuality, marital status, pregnancy, race or physical or mental disability (Australian Mining Review, 2018). Furthermore, the Act addresses victimisation and sexual harassment, ensuring a safer and more inclusive work environment (Australian Mining Review, 2018). This legislation significantly facilitated women's entry into the mining profession.

In recent decades, Australia has enacted several legislative measures to promote gender diversity and inclusion in the workforce, including in the mining industry. These include the Sex Discrimination Act of 1984, the Fair Work Act of 2009 and the Workplace Gender Equality Act of 2012.

The 1984 Sex Discrimination Act prohibits discrimination based on sex, marital status, pregnancy or potential pregnancy in employment (Australian Human Rights Commission, 2024). The Fair Work Act of 2009 established minimum employment standards, including provisions for parental leave, flexible working arrangements and protection from discrimination and unfair dismissal (Australian Government, 2009). The Workplace Gender Equality Act of 2012 further supports women's entry into mining by requiring companies with 100 or more employees to report annually on six gender equality indicators, thereby standardising the country's reporting framework (Weldegiorgis, 2022:45). Collectively, these legislative measures aim to create an inclusive and equitable workplace environment, promote equal opportunities and address obstacles to women's participation in various sectors, including the mining industry (AusIMM, 2022a).

Women's representation and participation in the industry. Women's employment in the Australian mining industry has gradually increased (Weldegiorgis, 2022:4). Although women remain underrepresented, their participation is notably higher in large-scale mining operations than in small-scale or artisanal mining (Parmenter & Drummond, 2022:2). Historically, women's initial role in this industry was in wash facilities at Queensland's coal mines. Today,

women have expanded their presence across various mining operations (Abrahamsson *et al*., 2014:13).

Despite ongoing development, the mining industry in Australia has traditionally been a non-traditional domain for women, primarily because of historical discriminatory practices (Australian Mining Review, 2018; Connell & Claughton, 2018). In the past, prevailing misconceptions held that men were ideal mining employees, believed to be free from household responsibilities, which influenced hiring practices and workplace interactions (Kljajevic, 2015:15). As noted above, currently, women constitute 16% of the mining workforce in Australia (Hatch, 2023). This representation is higher among younger workers (under 30 years of age) and diminishes with age, in contrast to the male prevalence, which increases in older age groups. Family-related issues often compel women to leave their jobs as they transition into adulthood (Weldegiorgis, 2022: IV).

Challenges women face in the mining industry. Despite decades of policies and initiatives aimed at increasing women's representation in the mining industry, women continue to face many challenges, including pervasive perceptions and stereotypes; work–life balance issues; hostile workplace culture, discrimination and harassment; limited educational and career advancement opportunities; health and safety concerns and lack of inclusive facilities and infrastructure; and the gender pay gap (Denison & Pringle, 2023; Helbert, 2018:231–246; ILO, 2021a:22–23; Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2023:76; Kljajevic, 2015:29; McKinsey & Company, 2021a).

Pervasive perceptions and stereotypes. Traditional perceptions of mining as a male-dominated and physically demanding industry persist, discouraging women from pursuing careers in the industry (McKinsey & Company, 2021a). Societal biases against women entering male-dominated fields further exacerbate this issue (Kljajevic, 2015:52). Although some women are employed in the mining industry, their low representation, particularly in non-traditional roles, suggests that opportunities are not fully utilised (Mashaba, 2022:95). The lack of emphasis on promoting mining as a potential career path for women is a concern for many women (Weldegiorgis, 2022). The male-dominated culture, gender pay gap and family-related challenges deter many women from choosing mining careers (Mayes & Pini, 2014:530; Weldegiorgis, 2022).

Work–life balance issues. The demanding nature of mining work, often involving remote locations, shift work and extended periods away from home, complicates women's ability to balance their professional and personal responsibilities (ILO, 2021a:27). Gender roles and the gendered division of labour, coupled with inadequate parental leave policies and childcare

support and inflexible working hours, further hinder women's ability to achieve a work–life balance (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2023:76).

Hostile workplace culture, discrimination and harassment. The hypermasculine culture prevalent in the mining industry fosters environments where discrimination, harassment and gender-based violence are tolerated, thereby deterring women from entering or remaining in the industry (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2023:76). Patriarchal workplace cultures perpetuate discrimination that favours men and forces women to work harder to fit in with the existing macho culture (Helbert, 2018; Kljajevic, 2015:44). Reports on sexism and gender-based harassment further highlight the unwelcoming nature of the industry for women (Eveline & Booth, 2002:149; ILO, 2021a:23).

Limited educational and career advancement opportunities. The mining industry's limited emphasis on mentorship, role models and technical education for women hampers career advancement. Technological innovations have disproportionately affected women by eliminating unskilled jobs, exacerbating gender disparities ((Lahiri-Dutt, 2012a, 2012b:456; Romano & Papastefanaki, 2020:191–230; Vanja, 2019). Furthermore, women's underrepresentation in technical and operational positions, such as technicians, trade workers and machinery operators, restricts their employment opportunities (Weldegiorgis, 2022:vi). Occupational segregation further confines women to lower-paying administrative roles, while men dominate higher-paying technical and managerial positions (AusIMM, 2022a). Enhancing women's participation necessitates implementing flexible work environments, fostering inclusive workplace cultures and promoting career progression (Weldegiorgis, 2022:57–58). Collaborative efforts between industry associations, companies and educational institutions are essential for developing targeted training programmes and scholarships for women, with tailored support for Indigenous women who face systematic racism and sexism (Weldegiorgis 2022:57).

Health and safety concerns and lack of inclusive facilities and infrastructure. The mining industry often fails to prioritise the health and safety of women, offering inadequate PPE, men-only facilities and insufficient protective measures for pregnant and nursing women (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2023:76). This lack of inclusive infrastructure further marginalises women in the workplace.

Gender pay gap. Gender pay disparities persist in the mining industry, particularly among higher-skilled women. The gender pay gap is exacerbated by underemployment, lack of career path development, limited sponsorship and mentorship opportunities, and the

overrepresentation of women in lower-paying administrative roles (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2023:76). Addressing these disparities and promoting equitable pay standards are crucial for fostering an inclusive environment for women in mining.

While progress has been made in recent years, addressing these multifaceted challenges and promoting a more inclusive and supportive environment for women in the mining industry remains an ongoing endeavour in Australia. The following section highlights initiatives encouraging women's participation and empowerment in the Australian mining industry.

Initiatives to promote women's participation and empowerment in the mining industry. The following initiatives were introduced and implemented in Australia to encourage women's participation and empowerment in the Australian mining industry: the Australian Women in Resources Alliance (AWRA), Women in Mining and Resources Queensland (WIMARQ), Women in Mining and Resources Western Australia (WIMWA), the Australasian Institute of Mining and Metallurgy (AusIMM) Women in Mining Networks, diversity and inclusion programmes, mentoring and leadership development programmes, and science, technology, engineering and mathematics (STEM) education and outreach programmes. These initiatives aim to create a supportive and inclusive environment for women, address their challenges and encourage them to pursue and advance their careers in the mining industry.

- AWRA is a national initiative that brings together mining companies, government agencies and industry associations to promote and support women's attraction, retention and development in the resource sector (AWRA, 2023).
- WIMARQ offers networking, mentoring and professional development opportunities for women in Queensland's mining and resources industry (WIMARQ, 2023).
- WIMWA was founded by Sabina Shugg in 2003 to address the low representation of women in mining. WIMWA's objectives include encouraging more women to enter the industry, fostering a strong network among women in mining and advocating proactive measures to recruit and retain women (WIMWA, 2022). WIMWA, a prominent organisation, aims to support women in the mining and resources sector through networking events, mentoring programmes and advocacy efforts (WIMWA, 2022).
- AusIMM has established Women in Mining Networks across various regions to connect, support and empower women in the mining industry through networking events, mentoring and professional development initiatives (AusIMM, 2023).
- Many mining companies in Australia have implemented diversity and inclusion programmes, policies and initiatives to promote gender equality, create inclusive workplace cultures and support women's recruitment, retention and advancement in

the industry (Deloitte, 2023). The Diversity Council Australia (DCA), formerly the Council for Equal Opportunity in Employment, is an independent non-profit organisation advocating for diversity in human resource practices (DCA, 2022).

- Organisations such as the Australian Mines and Metals Association and individual mining companies offer mentoring and leadership development programmes designed for women in the mining industry to support their career progression and personal growth (AMMA, 2023). Furthermore, the Women Leaders Institute was established to promote and enhance women's leadership by offering a supportive environment for emerging female leaders in Australia, New Zealand and Asia to learn and network (Women Leaders Institute, 2021). Finally, the Women's Leadership and Development Program, supported by the Australian government, allocates funds to projects aimed at improving outcomes for Australian women in various focus areas, including women's job creation, economic security, workforce participation, leadership, safety and international engagement in the mining industry (Australian Resources and Energy Employer Association, 2023; Weldegiorgis, 2022:44).
- Initiatives aimed at encouraging more girls and young women to pursue STEM education and careers, including those in the mining industry, have been implemented by government agencies, educational institutions and industry organisations (CSIRO, 2023).

In summary, these initiatives and ongoing efforts to address the challenges women face in the mining industry aim to create a more inclusive and supportive environment, promote gender diversity and empower them to pursue and advance their careers in this industry.

3.2.2 Brazil

This section presents an overview of the representation and participation of women in the Brazilian mining industry.

Overview of the mining industry. Historically, the Brazilian mining industry has been the cornerstone of the country's economy, tracing its origin to the colonial era. The Portuguese initiated the initial wave of mining activity in the gold-rich region, later known as Minas Gerais (Bacha & Bonelli, 2016:151–181). Notably, the discovery of gold in 1693 and diamonds in 1729 marked significant milestones in Brazil's mining history, with substantial extraction commencing in the 19th century through English and French companies (Machado & Figueirôa, 2022:253–265; Mendonça-Figueirôa, 2016:183–194).

Throughout the 19th century, Brazil's mineral production expanded to include coal, lignite, peat, oil and iron (Machado & Figueirôa, 2022:253–265). This diversification has continued to the present day, establishing Brazil as one of the world's top five mineral producers and significantly contributing to its GDP (National Mining Agency, 2021). In 2020, Brazil's mineral production was valued at US$43.7 billion, with mining activities accounting for 2.4% of the country's GDP (National Mining Agency, 2021; OECD, 2022). The mining industry's impact extends beyond economic measures, influencing regional development through job creation, tax revenues and improvements in local services and trade (Valadares *et al*., 2022:3).

The resilience of the sector has been extensively tested during the Covid-19 pandemic. Despite the global economic downturn, Brazil's mining industry reported a turnover of approximately US$33 billion in 2020, an increase of 36% from the previous year. This growth was attributed to increased sales to China, higher international mineral prices and the devaluation of the Brazilian real, which boosted export earnings (National Mining Agency, 2021).

Legislative framework. Historically, legal barriers have significantly hindered women's participation in mining activities in Brazil. In Brazil, women's work was prohibited in underground mines in 1938. However, there are few records of law enforcement, as evidence shows that women were a significant workforce in the mines in the 1940s and the 1950s (Valadares *et al*., 2022:3). This ban was part of a broader global trend in the early 20th century that saw many countries enacting 'protective' legislation to exclude women from mining, often based on paternalistic attitudes and concerns about women's safety and morality (Romano & Papastefanaki, 2020:221).

Legislation regarding women in mining has not changed for several decades following the 1938 prohibition. This period coincided with the broader 'delabourisation' of women's work in numerous sectors, where women were increasingly excluded from formal wage work (Romano & Papastefanaki, 2020:192).

The Brazilian Federal Constitution of 1988 was crucial in establishing the principles of non-discrimination and equal rights, which formed the basis for subsequent policies and initiatives (Republic of Brazil, 1988). Recent legislative efforts aimed at supporting women's participation in the mining industry include the following:

- Law No. 13.575/2017: The Brazilian National Mining Agency (Agência Nacional de Mineração) mandated promoting diversity and inclusion in the mining industry (Republic of Brazil, 2017b).

- Law No. 13.540/2017: This law reformulated the royalty regime in the mining industry to foster a more equitable distribution of benefits (Republic of Brazil, 2017a).
- Decree No. 9.406/2018: This decree specified the competencies of the Brazilian National Mining Agency and introduced new environmental and public safety requirements, including provisions related to gender equality and the protection of women's rights in mining operations (Republic of Brazil, 2018a).
- Decree No. 9.407/2018: This decree established a new royalty payment structure to ensure fair compensation for mining activities and support local communities, including women (Republic of Brazil, 2018b).

A significant legislative milestone occurred on 4 July 2023 with the enactment of Law 14,611. This law amended the Brazilian Labour Code (Consolidation of Labour Laws) to establish equal pay for equal work. It introduced measures to ensure wage equality between men and women (Takano *et al*., 2023). This recent legislation promotes gender equality in the workplace, including the mining industry. The Brazilian labour law framework also includes provisions prohibiting discrimination and advocating gender equality in mining. Women occupy technical and managerial roles in Brazil's mining industry (Takano *et al*., 2023).

While these legislative measures mark significant steps towards promoting gender equality and empowering women in the mining industry, challenges persist in their implementation and effectiveness. Addressing these ongoing challenges is crucial for fostering Brazil's inclusive and equitable mining industry.

Women's representation and participation in the industry. In Brazil, women's participation in large-scale mining is gradually increasing; however, significant numbers still primarily engage in artisanal and small-scale mining, notably in the informal gold mining industry in the Amazon region (Blundi, 2022). Despite evolving economic landscapes and societal changes, the mining industry continues to exhibit substantial gender disparities, with women predominantly occupying auxiliary tasks such as administrative, supportive and community-oriented roles, while technical and operational positions remain less accessible (Blundi, 2022; Valadares *et al*., 2022:3). Historically, the Brazilian mining industry has been characterised by perceptions of masculinity rooted in physically demanding labour, necessitating strength and endurance (Valadares *et al*., 2022:3). Despite efforts to promote gender diversity and equality, the sector's efforts are yet to significantly alter the landscape of gender representation in large-scale mining operations. According to the Women in Mining Brazil (WIM Brazil) report, women accounted for only 15% of the total workforce in the mining industry in 2021. Moreover, women's representation in executive boardrooms within large-scale mining operations remains alarmingly low, with fewer than 11% holding such positions (Valadares *et al*., 2022:3).

Challenges women face in the mining industry. Despite decades of policies and initiatives to increase women's participation and representation in the mining industry, they face various challenges in this male-dominated industry. Some of the critical challenges faced by women in the Brazilian mining industry, particularly in large-scale mining operations, include gender discrimination and bias; societal and cultural norms; workplace culture, harassment and discrimination; health and safety; work–life balance challenges; educational and training barriers; and a lack of role models and mentorship (ILO, 2021b:36–38; Mendes *et al*., 2022; Pietropaoli & Baez, 2020:610; Pizarro & Fuenzalida, 2021:365–366; UNEP, 2023; Valadares *et al*., 2022).

Gender discrimination and bias. Women in the Brazilian mining industry often experience discrimination and bias that limit their career opportunities. This manifests as unequal pay, restricted access to leadership roles and exclusion from decision-making processes (Mendes *et al*., 2022). Persistent stereotypes perceive mining as male-dominated, perpetuating gender inequality (Valadares *et al*., 2022).

Societal and cultural norms. Cultural perceptions of mining as a male-centric industry discourage women from pursuing careers. Traditional gender roles relegate women to supporting roles, reinforcing the view that mining is unsuitable (Valadares *et al*., 2022). These norms create additional barriers to the acceptance and integration of women into mining.

Workplace culture, harassment and discrimination. Historically, the mining industry's male-dominated culture has contributed to a challenging work environment for women. The underrepresentation of women in mining can be interpreted as stemming from concerns about the potential erosion of male dominance in this field, challenging the traditional perception of mining as exclusively male-dominated (Van Klaveren *et al.*, 2009:20). Reports of harassment, discrimination and gender biases are standard, fostering a hostile atmosphere that undermines women's professional capabilities (Valadares *et al*., 2022), often relegating women to administrative and support roles, which are perceived as less valuable than direct mining positions (Pietropaoli & Baez, 2020:610; UNEP, 2023; Valadares *et al*., 2022:3–4). Sexual harassment and exposure to risks are heightened concerns for female employees in the Brazilian mining industry, exacerbated by dismissive and exclusionary behaviour from their male counterparts, which not only undermines women's competence, but also fosters a hostile workplace atmosphere (Pietropaoli & Baez, 2020:610). Gender discrimination and prejudice persistently afflict women, particularly in industries such as mining, where stereotypes undermine their competence (Valadares *et al*., 2022:2). In artisanal and small-scale mining, prevailing norms often confine women to menial roles, perpetuating gender disparities and hindering efforts towards achieving gender equality in the mining workforce (Valadares *et al.*,

2022:2). Issues such as inadequate facilities and safety measures tailored to women's needs further exacerbate these challenges (Mendes *et al*., 2022).

Health and safety. The health risks faced by women during mining are multifaceted and pose significant challenges to their well-being. Exposure to hazardous substances, such as mercury, in artisanal gold mining can lead to respiratory problems and mercury poisoning (ILO, 2021a:1). Furthermore, the physically demanding nature of mining work exposes women to various health issues, including respiratory illnesses and musculoskeletal disorders, exacerbated by harsh environmental conditions (Pizarro & Fuenzalida, 2021:365–366). Mental health concerns, such as anxiety and depression, are prevalent due to demanding work schedules and isolation (Pizarro & Fuenzalida, 2021:365–366). Limited access to healthcare services in remote mining areas amplifies sexual and reproductive health risks, including sexually transmitted infections and unwanted pregnancies (Mendes *et al*., 2022:2). Lastly, gender-based violence, stemming from the isolated and male-dominated nature of mining communities, creates an unsafe working environment for women. These health risks underscore the urgent need for comprehensive interventions to safeguard the well-being of women in mining (ILO, 2021a:36–38).

Work–life balance challenges. The demanding nature of mining operations poses significant challenges for women seeking to balance work responsibilities with their personal lives, particularly caregiving duties. Long working hours, remote locations and frequent travel create barriers disproportionately affecting women's career advancement and retention (Valadares *et al*., 2022). The demanding work hours and extended absences from home inherent in the mining industry pose significant challenges for women, especially for primary caregivers. It is difficult to balance professional and familial responsibilities effectively (Valadares *et al*., 2022:4). Factors such as maternity leave and childcare obligations further exacerbate impediments to women's career advancement in the mining industry (Valadares *et al*., 2022:4).

Educational and training barriers. Historically, fewer women have pursued education and training in mining-related fields such as engineering, geology and metallurgy, limiting the pool of qualified female candidates for mining roles (Valadares *et al.*, 2022). This educational disparity perpetuates gender imbalances in the industry and hinders women's professional development.

Lack of role models and mentorship. The underrepresentation of women in leadership roles in the mining industry results in a scarcity of female role models and mentors. This lack of

support networks further impedes women's career progression and reinforces gender disparities (Mendes *et al*., 2022).

These challenges mentioned above are often interconnected and can reinforce one another, resulting in women's persistent underrepresentation in the mining industry. Addressing these issues requires a multifaceted approach involving policy changes, workplace initiatives, educational programmes and cultural shifts to create a more inclusive and supportive environment for women in mining.

Initiatives to promote women's participation and empowerment in the mining industry. Brazil has introduced and implemented the following initiatives to encourage women's participation and empowerment in the mining industry: WIM Brazil, diversity and inclusion programmes, education and training initiatives, community engagement and empowerment, and government policies and regulations.

- WIM Brazil was established in 2019 to improve the Brazilian mineral sector. WIM Brazil (2024) advocates for inclusive and diverse work environments, fostering respect for women across all organisational levels and fields of activity, while also championing women's technical expertise, operational excellence and innovation. Their strategic goals, as outlined in their 2023 report, include increasing women's participation, particularly in leadership roles; integrating diversity, responsibility and sustainability into the mining industry; supporting companies led by women; promoting supplier diversity; investing in STEM education to cultivate future talent; empowering women at the community level; amplifying the impact of the WIM movement nationally and internationally; and leading the implementation of environmental, social and governance practices (WIM Brazil, 2024). WIM Brazil devised an action plan to achieve these objectives, including support and funding from Canada's Department for Women and Gender Education. This collaboration with WIM Canada, which led to the development of a National Action Plan in 2016, aims to share best practices and strategies to enhance gender inclusion in the Brazilian mining industry (WIM Brazil, 2024).
- Several mining firms in Brazil have implemented diversity and inclusion programmes. These programmes are intended to attract, retain and promote women in the workforce through mentoring, leadership development and flexible work arrangements (WIM Brazil, 2024).
- Educational and training initiatives encourage women to pursue education and training in mining-related fields such as engineering, geology and metallurgy. These include

outreach programmes, scholarships and partnerships with educational institutions (WIM Brazil, 2024).

- Community engagement and empowerment initiatives have focused on empowering women in mining communities. These programmes include skills training, entrepreneurial assistance and improved access to education and healthcare services (WIM Brazil, 2024).
- Government policies and regulations are crucial for promoting gender equality and women's empowerment in the mining industry. Legislative measures have been implemented to promote diversity, inclusion, fair compensation, and robust environmental and safety standards (WIM Brazil, 2024).

While these initiatives demonstrate substantial progress towards promoting women's participation and empowerment in the Brazilian mining industry, ongoing efforts are essential to overcome the persistent challenges women face. Continuous evaluation and adaptation of these programmes are necessary to ensure their long-term effectiveness and impact.

3.2.3 Canada

This section contextualises the mining industry in Canada and elaborates on women's representation therein.

Overview of the mining industry. The mining industry in Canada is a major component of the nation's economy and is characterised by the production of more than 60 unique minerals and metals. According to the Government of Canada (2022), Canada's mining industry is among the world's largest, reflecting the diversity and scale of its mineral resources. The industry has a storied history, with industrial-scale mining dating back to the late 18th century. Notably, the first significant mining operation was an iron mine in Forges du Saint-Maurice near Trois-Rivières, Quebec, which operated from 1738 to 1883 (Garside, 2020; Government of Canada, 2021).

Canada is the global leader in producing several critical minerals and metals. It is the world's largest producer of potash, the second-largest producer of uranium, and ranks fourth and fifth in the production of aluminium and nickel, respectively (Garside, 2020; Government of Canada, 2021). Canada is also prominent among the top 10 commodity metal and mineral producers, such as diamonds, gemstones, gold, indium, niobium, platinum group metals and titanium concentrate (Garside, 2020). The vast array of minerals produced in Canada includes essential raw materials used in various industries, from fertilisers and construction materials

to advanced technologies such as electric vehicles and solar cells (Government of Canada, 2021).

Mining activities in Canada are geographically widespread, with operations in almost every region, often in rural areas away from metropolitan centres. Corporate, regional or commodity division offices are typically found in major urban centres such as Toronto, Vancouver, Montreal, Saskatoon and Sudbury (Peltier-Huntley, 2022).

The mining industry plays a pivotal economic role in Canada. In 2022, the combined mining, quarrying, and oil and gas extraction sectors contributed 7.8% to Canada's GDP. The industry employs approximately 665 000 people across Canadian communities and is the largest employer of indigenous people in the private sector (Mining Association of Canada, 2023). Despite significant economic contributions, women's representation in the mining workforce remains modest at approximately 17%, with only slight increases observed over the past decade.

The Covid-19 pandemic substantially disrupted the mining industry and affected operations and supply chains. However, the industry demonstrated resilience, with a robust recovery in mineral and metal production after the pandemic (Mining Association of Canada, 2024). This resilience highlights the sector's critical role in the Canadian economy and its capacity to adapt to global challenges (Mining Association of Canada, 2024).

Legislative framework. The evolution of the legislative framework governing women's employment in the Canadian mining industry has significantly influenced the industry's gender dynamics. One of the most pivotal pieces of legislation was the Ontario Mining Act of 1890, which prohibited women from being employed in mining operations (Peltier-Huntley, 2019:12). This Act was a direct derivative of the United Kingdom Mines and Collieries Act of 1842, which similarly barred women from working in mining roles and reinforced a male-dominant culture in the industry (Lahiri-Dutt, 2019:14; Mashaba, 2022:97).

The prohibition on female employment in mining by the Ontario Mining Act of 1890 was not revisited until 1913, when amendments permitted women to engage in 'traditional' roles, such as domestic (cooking and cleaning) and clerical jobs in mine offices (Women Who Rock, 2016). This minor concession did not challenge the entrenched male dominance in the industry. However, during World War II, a temporary repeal of this ban in 1942 allowed women to occupy various surface-level roles, including operators of ore distributors, repairers of cell flotation equipment, pilots of ore trains and machine shop employees (Mercier, 2011:33). The

post-war period saw a reversion to previous restrictions, with the prohibition on women's employment in mining reinstated in 1960 (Mellor, 2018:3–6; Mercier, 2011:33).

This legislative back-and-forth underscores the persistent gender discrimination in the mining industry. Women remained barred from underground jobs until 1978, and surface job prohibitions were in place until 1970 (Keck & Powell, 2006:293). Even when women were allowed to work in mining, they were often limited to non-manual roles or those associated with health and welfare, reinforcing traditional gender roles and restricting opportunities for women to engage in more diverse and influential positions in the industry (Women Who Rock, 2016).

In recent years, Canadian legislative and policy frameworks have shifted towards promoting greater gender diversity and inclusion in the mining industry. This modern legislative landscape is exemplified by the Canadian Minerals and Metals Plan (CMMP), established in 2019. One of the critical components of this plan is the Women and the Mine of the Future Project, which aims to increase women's participation in mining to 30% (Peltier-Huntley, 2022:3–4).

Furthermore, the Mining Association of Canada has committed to enhancing the sector's diversity, equity and inclusion. In 2020, the Mining Association of Canada announced initiatives to support these values, reflecting broader recognition in the industry of the importance of gender diversity (Peltier-Huntley, 2022:3).

The legislative evolution from prohibiting women's employment in mining to actively promoting gender diversity signifies a transformative shift in the sector's approach to workforce inclusivity. Modern policies and programmes at provincial and federal levels are increasingly focused on encouraging women's entry to and retention in the mining industry. These initiatives represent a critical move towards addressing historical imbalances and fostering a more inclusive and equitable mining industry in Canada.

Women's representation and participation in the industry. Historically, women's participation in mining has been notably low, primarily because of societal norms and explicit legal restrictions. In Canada, legislation prohibited the full participation of women in surface and underground mining until 1970 and 1978, respectively. These prohibitions were rooted in traditional gender roles and concerns about the physical demands and safety of mining work for women. Despite these historical barriers, the past few decades have gradually increased female representation in the industry (Peltier-Huntley, 2022). Recent data from Statistics Canada's labour force survey revealed a substantial presence of women in the Canadian

mining industry. In 2021, approximately 31.5 million Canadians were employed in mining-related industries, constituting 60% of the working-age population (Peltier-Huntley, 2022:1). Specifically, women accounted for 19% of the workforce in the mining, quarrying, and oil and gas sectors by 2022 (Peltier-Huntley, 2022:1). However, the representation of women varies across different facets of mining activities, including exploration, mining operations, manufacturing and fabrication, and support services in large-scale mining (Peltier-Huntley, 2022:1). However, women are predominantly employed in administrative and support roles within these areas, rather than in technical or leadership positions. Women account for approximately 17% of the workforce in large-scale mining, with a particularly low representation in high-impact roles such as C-suite positions, accounting for only 13% (Peltier-Huntley, 2022:1).

Challenges women face in the mining industry. Women in the Canadian mining industry face many historical, cultural and systemic challenges, particularly in large-scale mining operations. Despite efforts to increase gender diversity and create a more inclusive environment, the industry remains largely male-dominated, and women encounter significant barriers to entry and advancement. Some of the critical challenges faced by women in the Canadian mining industry, particularly in large-scale mining operations, include workplace culture and harassment, work–life balance challenges, career advancement and gender inequity, and underrepresentation in technical roles.

Workplace culture and harassment. One of the primary challenges for women in the mining industry is adapting to a workplace culture that has traditionally been male-dominated and often characterised by a ‘macho’ ethos (Keck & Powel, 2006:286). This culture can be unwelcoming or even hostile to women, who may struggle to fit in and gain acceptance from their male colleagues (Keck & Powel, 2006:286). Moreover, sexual harassment remains a pervasive issue, with reports of women facing sexual language, obscene jokes, threats and both verbal and physical assault (Keck & Powel, 2006:286). A 2016 survey by the Mining Industry Human Resources Council found that women were more likely than men to report negative work experiences, with one-third of women indicating they had been victims of harassment, bullying or assault (MIHR, 2016a:14). Women often face harassment, bullying and discrimination that can hinder their career progression.

Work–life balance challenges. Achieving work–life balance is particularly challenging for women in the mining industry. The demanding nature of mining jobs, which often require long hours, remote locations and fly-in/fly-out assignments, exacerbates this issue (Peltier-Huntley, 2022:33). The lack of childcare facilities in mining villages further complicates matters, forcing single women to rely on family members to support their domestic obligations (Keck & Powel,

2006:286). This imbalance can lead to significant stress and may deter women from pursuing long-term mining careers. Work–life balance issues continue to be a problem for women. Balancing work and personal and family obligations remains difficult for women who desire to work in the industry, especially miners working in remote areas or on fly-in/fly-out assignments (Peltier-Huntley, 2022:33).

Career advancement and gender inequity. Despite removing legislative barriers that once prevented women from working in mining, the perception of a miner as inherently male persists (Romano & Papastefanaki, 2020:191). This stereotype, combined with systemic gender inequality, hampers women's career progression. Women in the mining industry report fewer opportunities for advancement than their male counterparts, partly due to unequal access to support networks and mentorship (Peltier-Huntley, 2022:34). In addition, gender pay gaps remain a significant issue, with women often earning less than their male colleagues, leading to dissatisfaction and higher attrition rates (McKinsey & Company, 2021b). Women in mining often earn less than their male colleagues, contributing to dissatisfaction and higher attrition rates.

Underrepresentation in technical roles. Women are notably underrepresented in technical and operational roles in the mining industry, which are critical for career advancement. This underrepresentation can be attributed to a combination of factors, including gender bias in hiring and promotion practices and a lack of targeted training and development programmes for women (MIHR, 2016a:14). The limited presence of women in these critical roles not only restricts career growth, but also perpetuates the cycle of gender inequity in the industry.

Despite decades of policies and initiatives to increase women's participation and representation in the mining industry, significant challenges remain. Women in large-scale mining operations in Canada continue to face workplace harassment and discrimination, struggle with work–life balance, encounter barriers to career advancement, suffer from gender pay gaps and are underrepresented in their technical roles. Addressing these issues requires concerted efforts from industry stakeholders to create a more inclusive and supportive environment for women, ensuring equal opportunities to succeed in the mining industry.

Initiatives to promote women's participation and empowerment in the mining industry. The following initiatives were introduced and implemented in Canada to encourage women's participation and empowerment in the Canadian mining industry: Women in Mining Canada (WIMC), the Gender Equity in Mining Works Program, the CMMP, the Indigenous Skills and Employment Training Strategy and the Gearing Up Wage Subsidy Program. These initiatives

aim to create a supportive and inclusive environment for women, address their challenges and encourage them to pursue and advance their careers in the mining industry.

- Since its inception in 2009, WIMC has been dedicated to promoting and empowering women in the mining industry. WIMC's primary objective is to educate women and equip them with the necessary information and resources to foster awareness of inclusion, equality and diversity (WIM Canada, 2021a). In addition, WIMC aims to assist women in developing the requisite skills to emerge as leaders in the mining industry (WIM Canada, 2021a).
- The Gender Equity in Mining Works Program was intended to attract more women to the mining industry and foster an inclusive work environment. The Program addresses systemic barriers that hinder women's participation and retention in mining (WIM Canada, 2021b).
- The CMMP envisions 30% female participation in the mining industry. This includes comprehensive strategies to promote women's participation, retention and advancement in the industry. The plan emphasises the importance of a diverse workforce for the future sustainability of the mining industry (Government of Canada, 2019.
- The Indigenous Skills and Employment Training Strategy encourages Indigenous women to acquire skills necessary for employment in the mining industry. By focusing on this demographic, the Strategy strives to address gender and ethnic disparities in the industry, providing tailored support to enhance employment and career progression (Government of Canada, 2021).
- The Gearing Up Wage Subsidy Program is intended to attract and retain younger workers, including women, to create a more sustainable future for the mining industry. Gearing Up helps mitigate financial barriers to entry by providing wage subsidies and offering practical work experience, thereby enabling a diverse network of future mining professionals (MIHR, 2021).

These initiatives are essential to address women's challenges in the mining industry. They aimed to dismantle barriers to entry and advancement, promote a more diverse and inclusive industry, and ensure that women are fully represented and empowered. By fostering an environment of equality and inclusion, these programmes benefit women and contribute to the overall growth and sustainability of Canada's mining industry.

3.2.4 United Kingdom

This section presents an overview of women's representation and participation in the UK's mining industry.

Overview of the mining industry. The mining industry in the UK has a rich history dating back to the Industrial Revolution, when it played a pivotal role in economic development. This industry has historically been diverse, encompassing the extraction of energy minerals such as oil, natural gas and coal, as well as industrial minerals such as potash, silica and China clay (Bide *et al*., 2014). The UK produces a variety of minerals that can be broadly categorised as construction, industrial and metal minerals. Construction minerals include aggregates, brick clay and raw cement. Industrial minerals include kaolin, ball clay, silica sand, gypsum, potash, polyhalite, salt, industrial carbonates, fluorspar and baryte. The metal minerals include tungsten and gold (Garside, 2021). Mining in the UK has been significant since the Industrial Revolution and has contributed to the country's industrial and economic growth. Coal and iron mining, in particular, flourished during this period, fuelling industrial advancements and infrastructure development.

However, resource depletion and shifts in energy preferences have led to declining mining activities in recent decades (Lempriere, 2018). By the 1930s, the coal mining industry employed over one million people, but this number had drastically decreased to less than 1 000 by 2016 due to changing energy policies and economic factors (Garside, 2022). Women represent an estimated 8 to 17% of the global mining workforce, with the UK reflecting similar trends. The representation of women in senior leadership roles in the mining industry remains low, with significant drop-offs from entry-level to executive positions (Bide *et al*., 2014). This gender disparity is a critical issue that the industry must address to foster a more inclusive and diverse workforce.

As of the first quarter of 2024, the GDP from mining in the UK was £3 301 million, a decrease from £3 374 million in the fourth quarter of 2023. Extractive industries, including mining, will contribute approximately 0.79% to the UK's GDP by 2023 (Office for National Statistics, 2024). This figure highlights the sector's relatively small yet critical role in the broader economy, especially in regions where mining remains an essential economic activity.

The Covid-19 pandemic had a substantial impact on the mining industry, causing disruptions in operations and supply chains and declining demand for certain minerals. Mining companies faced challenges in maintaining production levels and ensuring the safety of workers during the pandemic. The resultant economic slowdown and restrictions on movement further

exacerbated these challenges, leading to significant operational and financial strain in the industry (Brauers *et al*., 2020). The mining industry commenced its recovery in 2022, with production levels progressively increasing to pre-pandemic projections (Skidmore, 2022). Nevertheless, this resurgence has encountered significant obstacles (Skidmore, 2022). The emergence of novel COVID-19 variants, particularly Omicron, has resulted in persistent labour shortages and operational disruptions, as reported by prominent mining corporations such as BHP and Rio Tinto (Skidmore, 2022). Notwithstanding these impediments, the overall impact on current production levels has been relatively transient, with numerous operations successfully maintaining output through strategic adaptations (Gałaś, 2021:39).

Legislative framework. Historically, the UK's mining industry has been shaped by legislative measures that have restricted and, more recently, promoted women's participation. This overview explores the evolution of legislative frameworks and their impact on gender dynamics in the UK mining industry. Historically, mining regulations in the UK reflected deeply ingrained societal norms that limited women's involvement in the industry. The Mines and Collieries Act of 1842 was pivotal legislation that explicitly prohibited women and young boys from working underground in coal mines. Spurred by the public outcry over hazardous working conditions, this legal framework ended centuries-old practices of women's labour in the mines (Lahiri-Dutt, 2020:389–397; Sinclair, 2021:2).

The unintended consequence of the 1842 Act was the reinforcement of Victorian-era gender norms, delineating what was considered appropriate work for women in an industrial context. This legislative precedent reverberated globally, influencing subsequent international labour standards concerning women's employment in mining (Sinclair, 2021). The Act also abolished the long and distinguished tradition of women's labour in the mining industry, enabling women to undertake more physically demanding and risky jobs (Lahiri-Dutt, 2020:389–397; Sinclair, 2021:2). This Act also served as a model for the ILO to create safeguards for women's employment in the mining industry in the 1920s and the 1930s (Sinclair, 2021:2).

In recent decades, a concerted effort has been made to revise outdated legislation and foster gender equality in the UK mining industry. Efforts have been made to address the obstacles women face in mining, including legal restrictions, workplace culture and safety concerns (ILO, 2021b:1). Key legislative initiatives include the Equality Act of 2010, which provides a comprehensive framework to combat discrimination and promote equal opportunities in all sectors, including mining (UK Government, 2010). It prohibits gender-based discrimination and offers adequate accommodation for individuals with protected characteristics (UK Government, 2010). The Mines Regulations of 2014 prioritise the health and safety of all mine

workers, including provisions to create a secure and inclusive workplace (UK Government, 2014). By addressing safety concerns and promoting inclusive practices, these regulations indirectly encourage greater gender diversity in the mining industry (UK Government, 2014). In 2017, the Gender Pay Gap Reporting requirement mandated that large companies disclose gender pay gap data to enhance transparency and accountability in pay practices (UK Government, 2017). This measure encourages companies to take proactive pay equity initiatives by highlighting disparities (UK Government, 2017).

Despite legislative advancements, significant challenges persist in promoting the participation of women in the mining industry. These challenges include legal barriers, persistent workplace cultures and ongoing safety concerns disproportionately affecting women. International bodies such as the ILO continue advocating for gender-inclusive global mining industry policies and practices (ILO, 2021a).

Ongoing legislative reforms and strategic interventions are crucial to overcoming systemic barriers and fostering a more inclusive mining industry. Addressing these challenges requires sustained commitment from government, industry and civil society stakeholders to ensure that legislative frameworks protect and actively promote gender equality and diversity in the UK mining industry.

The UK mining industry's legislative framework has evolved significantly from its restrictive origins to embracing the principles of equality and inclusivity. Although historical regulations exclude women from mining roles, contemporary legislation aims to dismantle barriers and create a more equitable environment. Continued legislative reform and proactive measures are essential to realising the full potential of gender diversity in the UK mining industry, fostering innovation, safety and social progress.

Women's representation and participation in the industry. Due to legal restrictions and societal norms, women's involvement in mining has historically been minimal. Over the past few decades, efforts have been made to increase their representation; however, progress has been slow and uneven. Women are involved in all phases of small-scale mining operations, but remain significantly underrepresented, comprising only 16% of the total mining workforce (Peltier-Huntley, 2022). The representation of women varies across mining activities, with 14% for exploitation, 29% for exploration, 17% for support services and 12% for manufacturing and fabrication (Peltier-Huntley, 2022).

In large-scale mining operations, the representation of women is even lower, and the ILO (2021b) states that women rarely constitute more than 10% of the workforce and are predominantly employed in administrative roles. Moreover, women are significantly underrepresented in high-paying jobs in large mining companies in the UK. According to Mining Technology (2022), only 11.1% of the highest-paying positions are held by women, with 88.9% by men. This gender imbalance in leadership and high-paying jobs highlights the ongoing challenges in achieving gender equality in the UK mining industry.

Challenges women face in the mining industry. Despite efforts to enhance gender diversity and foster inclusivity, the UK's mining industry remains predominantly male-dominated, presenting substantial barriers to entry and progression for women. This section discusses women's critical challenges in this industry, including the gender pay gap, work–life balance challenges, lack of career advancement opportunities, workplace culture, and health and safety concerns.

Gender pay gap. A significant disparity in earnings persists between men and women in mining, with women typically earning less than their male counterparts (McKinsey & Company, 2021b).

Work–life balance challenges. The demanding nature of mining work, characterised by shift work and long hours, challenges women to balance their professional responsibilities with their personal lives (Institute of Quarrying, 2020; McKinsey & Company, 2021b).

Lack of career advancement opportunities. Women encounter obstacles in advancing their careers, including having limited access to operational roles and inadequate frontline mentorship opportunities (McKinsey & Company, 2021b; WIM UK, 2019).

Workplace culture. The prevailing male-dominated culture in mining contributes to creating a hostile environment for women, which has an impact on their retention and career progression. Furthermore, gender biases hinder women's access to technical roles and perpetuate safety concerns (Ralushai, 2003:8–10).

Health and safety concerns. Women in the mining industry face distinct health and safety challenges, which are often overlooked in safety protocols designed primarily for male workers. Historical biases and hazardous working conditions have contributed to women enduring physically demanding tasks, such as working extended hours in oppressive underground environments, including during pregnancy (Health and Safety Executive, 2020; Ralushai, 2003:8–10). These conditions have resulted in severe health issues, such as spinal

and pelvic deformities, leading to complications during childbirth with tragic outcomes (Health and Safety Executive, 2020; Ralushai, 2003:8–10).

The UK's mining industry continues to grapple with gender disparities and systemic challenges that hinder women's participation and advancement. Addressing these issues requires concerted efforts to promote equitable pay practices, improve work–life balance, enhance career development opportunities, foster inclusive workplace cultures and prioritise gender-sensitive health and safety measures. By addressing these challenges, the industry can create a more welcoming and supportive environment for women, promoting long-term retention and advancement in the mining industry.

Initiatives to promote women's participation and empowerment in the mining industry. The following initiatives were introduced and implemented in the UK's mining industry to promote women's participation and empowerment: Women in Mining (WIM) UK Forum, which organises Networking and Professional Development, Gender Equality Forums, Career Awareness Programs, and Diversity and Inclusion Policies.

- In 2006, the WIM UK Forum was established to promote women's employment, retention and progress in the mining industry (WIM UK, 2022). WIM UK advocates for and speaks up for women in the mining industry, informing sector participants and decision-makers about women's challenges while pursuing jobs in mining and associated industries (WIM UK, 2022). The forum delivers a thought leadership analysis and research on business cases for diversity, inclusion and women's economic growth in mining. This was done through collaborations with leading mining corporations and other sector participants (WIM UK, 2022). WIM UK promotes the role of women in the mining industry and develops awareness of mining as a career opportunity for women by working with universities and other organisations (WIM UK, 2022).
- WIM UK organises networking events, educational seminars and mentoring programmes tailored to support women's professional growth in the mining industry. These initiatives facilitate knowledge sharing and skill development and create opportunities for career advancement and leadership roles (WIM UK, 2022).
- Many mining companies in the UK have established gender equality forums where female employees can voice their concerns, share experiences and network with their peers. These forums promote workplace inclusivity and address women's gender-specific challenges in the mining industry (WIM UK, 2022). Recognising the importance of early exposure, various initiatives have aimed to educate young women about mining-related qualifications and career paths. These programmes seek to attract

women to pursue careers in mining and related fields by dispelling stereotypes and showcasing diverse roles in the sector.

- Mining companies have implemented comprehensive diversity and inclusion policies to eliminate gender bias and create a supportive work environment for women. These policies encompass recruitment practices, career development opportunities and workplace accommodation designed to foster an inclusive culture that values diversity.

These initiatives aim to create a more inclusive and supportive environment for women in the mining industry, enabling them to address challenges and improve their representation and involvement.

3.2.5 Reflection on the global perspective of female employment in the mining industry

In conclusion, the representation of women in the mining industry of Australia, Brazil, Canada and the UK has evolved significantly over time, albeit with ongoing challenges and disparities. Historically, discriminatory laws and societal biases have barred women from participating in various roles in the mining industry. However, legislative reforms and societal shifts have gradually opened doors for women to enter and contribute to the industry.

In Australia, the mining industry has long been the cornerstone of the economy, with women comprising 16% of the workforce. Although women remain underrepresented, their participation is notably higher in large-scale mining operations than in small-scale or artisanal mining (Parmenter & Drummond, 2022:2). Legislative reforms such as the Equal Opportunity Act of 1984 and the Workplace Gender Equality Act of 2012 have played crucial roles in promoting gender equality and empowering women in the workplace. Initiatives such as WIMWA have advanced the cause of gender diversity in the industry.

Similarly, in Brazil, where women have historically faced significant barriers to entry, recent legislative changes have paved the way for greater gender equality in mining. In Brazil, women's participation in large-scale mining is gradually increasing; however, significant numbers still primarily engage in artisanal and small-scale mining, notably in the informal gold mining industry in the Amazon region (Blundi, 2022). According to the WIM Brazil report, women accounted for only 15% of the total workforce in the mining industry in 2021. Moreover, women's representation in executive boardrooms in large-scale mining operations remains alarmingly low, with fewer than 11% holding such positions (Valadares *et al.*, 2022:3). WIM Brazil and other initiatives are working towards creating inclusive work environments and increasing women's representation in leadership roles in mining.

Canada's mining industry has seen a notable increase in women's representation, with legislative reforms and initiatives such as WIMC driving progress. Women account for approximately 17% of the workforce in large-scale mining, with a particularly low representation in high-impact roles such as C-suite positions, accounting for only 13% (Peltier-Huntley, 2022:1). However, challenges such as workplace culture, harassment and work–life balance issues persist, highlighting the need for continued efforts to promote gender diversity and inclusion.

The mining industry has significantly transformed in the UK, with women playing increasingly integral roles. Women are involved in all phases of small-scale mining operations, but remain significantly underrepresented, comprising only 16% of the total mining workforce (Peltier-Huntley, 2022). The representation of women varies across mining activities, with 14% for exploitation, 29% for exploration, 17% for support services and 12% for manufacturing and fabrication (Peltier-Huntley, 2022). In large-scale mining operations, the representation of women is even lower, and the ILO (2021b) states that women rarely constitute more than 10% of the workforce and are predominantly employed in administrative roles. Initiatives such as WIM UK have advocated women's rights and promoted their participation in the industry.

Despite the progress made, challenges such as workplace culture and discrimination, harassment, work–life balance, health and safety concerns, and unequal access to opportunities persist across all four countries. Addressing these challenges requires ongoing commitment from stakeholders, including governments, companies and civil society organisations. By working together to dismantle barriers and create inclusive environments, women can be assumed to have equal opportunities to thrive and contribute to the success of the mining industry.

The following section outlines and discusses the crucial role of women's participation in the African mining industry – a topic of significant importance in gender equality and the mining industry.

3.3 AFRICAN OVERVIEW OF WOMEN EMPLOYED IN THE MINING INDUSTRY

This section provides an overview of women's participation in Africa's mining industry. The involvement of women in the mining industries in Ghana (West Africa), Rwanda (East Africa) and Zimbabwe (southern Africa) was explored. An overview of the South African context is provided in section 3.4. These countries were selected because of the availability of research

on women's participation in the mining industry. For each country's overview, the following are discussed:

- Overview of the mining industry
- Legislative framework
- Women's representation and participation in the industry
- Challenges women face in the mining industry
- Initiatives to promote women's participation and empowerment in the mining industry.

3.3.1 Ghana

This section presents an overview of the representation and participation of women in the Ghanaian mining industry.

Overview of the mining industry. Mining activities in Ghana date back to the colonial era, when the region was known as the Gold Coast. Since then, the industry has evolved into a cornerstone of the national economy, driving export earnings and employment opportunities across various mining operations (International Trade Administration, 2022a). It encompasses both large-scale mining operations and numerous small-scale enterprises, contributing significantly to employment, export revenues and foreign direct investment (Peltier-Huntley & Weldegiorgis, 2022:1). Ghana hosts 20 major large-scale mining companies that specialise in extracting gold, diamonds, bauxite and manganese (Naadi & Lansah, 2021). The Ghanaian mining industry primarily revolves around gold, making it Africa's leading producer of precious metals. In addition to gold, Ghana mines substantial quantities of bauxite, manganese and diamonds (Naadi & Lansah, 2021). The sector extracts natural gas, petroleum, salt and silver, thereby contributing to the country's diverse mineral wealth (Bermúdez-Lugo, 2012:9).

Mining remains Ghana's largest tax-paying sector, contributing significantly to the country's GDP and attracting substantial foreign direct investment. The industry accounts for 37% of Ghana's total exports and approximately 5% of its GDP, highlighting its critical economic importance (International Trade Administration, 2022a).

The Covid-19 pandemic had a notable impact on Ghana's mining industry, particularly in 2020, when gold production decreased by 12%, from 4.577 million ounces in 2019 to 4.023 million ounces. This decline reflected global supply chain disruptions and operational challenges faced by mining companies during the pandemic (International Trade Administration, 2022a).

Legislative framework. In Ghana, the legislative framework for women in mining reflects a progressive trajectory aimed at promoting gender equality and enhancing women's

participation in the sector. Historically, international conventions such as the ILO Underground Work (Women) Convention, 1935 (No. 45) influenced policies that restricted women from underground mining activities (ILO, 1935). Contemporary Ghanaian legislation and policies have evolved to foster inclusivity and empower women in the mining industry.

The Minerals and Mining Act 703 of 2006 is the cornerstone of Ghana's regulatory framework. Although gender-specific provisions are not explicitly stated, the Act mandates the localisation of employment and training opportunities, promoting gender diversity (Republic of Ghana, 2014). This approach aligns with broader national policies emphasising sustainable development and socioeconomic benefits from mining, including the economic empowerment of women (Republic of Ghana, 2014). The policy framework underscores gender equality and advocates for women's involvement in decision-making processes in mining communities, acknowledging the cultural and social contexts that historically excluded women (Republic of Ghana, 2014).

Ghana's National Gender Policy, implemented in 2015, is crucial to addressing cultural barriers and integrating gender perspectives into macroeconomic policies. This policy aims to eliminate gender inequalities across sectors, including mining, by fostering inclusive economic opportunities and ensuring equitable access to resources and decision making (Republic of Ghana, 2015:1). Constitutional provisions, particularly articles 17(1) and (2) of Ghana's 1992 Constitution, reinforce these commitments by guaranteeing gender equality and protection from discrimination based on social or economic status (Republic of Ghana, 2015).

Recent regulatory developments further highlight Ghana's commitment to enhancing women's participation in mining. The Minerals and Mining (Local Content and Local Participation) Regulations, 2020 (L.I. 2431) introduced measures to increase local participation, explicitly targeting gender equality and women's empowerment in the industry (Republic of Ghana, 2014). These regulations require mining companies to implement local content plans that include provisions for recruiting, training and promoting women in mining roles.

In summary, while Ghana's mining industry has historically excluded women due to cultural norms and international conventions, current legislative and policy frameworks demonstrate a significant shift towards gender inclusivity and empowerment. The Minerals and Mining Act, complemented by the National Gender Policy and recent local content regulations, collectively strives to create an enabling environment where women can actively contribute to and benefit from the country's mineral resource sector. These efforts reflect Ghana's commitment to

achieving gender equality goals and promoting sustainable development across all industries, including mining.

Women's representation and participation in the industry. Despite efforts to promote gender diversity and equality in the mining industry, women's representation and involvement in large-scale mining operations in Ghana remain low. The mining industry is viewed as male-dominated, where sociocultural norms and traditional beliefs play a role in excluding women (Siakwah, 2020). Women's representation and participation in Ghana's mining industry, particularly in large-scale mining, remains significantly lower than their involvement in artisanal and small-scale mining. Artisanal and small-scale mining plays a crucial role in extracting various minerals across Africa, employing a substantial workforce, a notable portion comprising women. According to Muthuri *et al*. (2021), women constitute between 30 and 50% of the artisanal and small-scale mining workforce in sub-Saharan Africa, reflecting their substantial presence in this industry.

By contrast, the participation of women in large-scale mining in Ghana was notably lower. Kansake *et al*. (2021) reported that women's involvement in large-scale mining is approximately 10%. This figure indicates a stark disparity compared with artisanal and small-scale mining, highlighting women's challenges in accessing opportunities in more extensive mining operations. Moreover, data from the Ghana Extractive Industries Transparency Initiative indicates that in 2020, women constituted only 1.3% of the workforce in large-scale mining operations (GHEITI, 2022). This underrepresentation underscores systemic barriers and inequities in the sector.

Challenges women face in the mining industry. Despite decades of policies and initiatives to increase women's participation and representation in the mining industry, women remain subject to numerous challenges. From 2016 to 2020, turnover rates among women in various sectors surpassed those among men in Ghana, highlighting women's difficulties at work and in their communities, often leading them to leave their mining jobs (Weldegiorgis, 2022: ix). The following are some of the critical challenges faced by women in Ghana's mining industry, particularly in large-scale mining operations: gender discrimination and stereotypes, workplace harassment and violence, lack of gender-specific facilities and equipment, work–life balance challenges, limited access to training and development opportunities, and health and safety concerns (ILO, 2023; Kilu *et al*., 2014; Siakwah, 2020; Weldegiorgis, 2022).

Gender discrimination and stereotypes. Women in the mining industry often experience discrimination and gender stereotypes that can hinder their career advancement and equal treatment (ILO, 2023; Siakwah, 2020).

Workplace harassment and violence. Sexual harassment, verbal abuse and physical violence are common experiences of women working in mining, creating an unsafe and hostile workplace (ILO, 2023; Kilu *et al*., 2014).

Lack of gender-specific facilities and equipment. Many mining sites lack adequate facilities and equipment for women, such as separate restrooms, changing rooms and properly fitting PPE (ILO, 2023).

Work–life balance challenges. The challenging nature of mining work, including long hours, shift work and remote locations, can make it difficult for women to balance their professional and personal duties, particularly those with caregiving roles (ILO, 2023; Kilu *et al*., 2014). This is supported by a survey conducted by the Business for Social Responsibility in 2017, which revealed that 70% of Ghanaian women cited barriers such as lack of childcare facilities, inflexible work arrangements and inadequate pay for childcare as primary reasons for leaving their jobs after maternity leave (BSR, 2017).

Limited access to training and development opportunities. Women in the mining industry often have limited access to training, mentoring and professional development opportunities, which hinders their career prospects (Kilu *et al*., 2014; Weldegiorgis, 2022). In addition, challenges for women persist in the mining industry regarding lack of awareness and access to STEM education and skills (Peltier-Huntley & Weldegiorgis, 2022:34). Government initiatives, such as STEM clinics and the Girl Child Scholarship programme, aim to address this gap. However, there remains a need for collaborative efforts between the mining industry and the government to actively tackle the challenges faced by women in mining (Peltier-Huntley & Weldegiorgis, 2022:34).

Health and safety concerns. Women in mining face distinct health and safety risks, such as exposure to hazardous materials, physical demands and inadequate sanitation facilities, which can have an impact on their health and productivity (ILO, 2023).

The abovementioned challenges are often interconnected and stem from deeply rooted sociocultural norms, gender biases and structural barriers that contribute to women's underrepresentation in the mining industry. Addressing these issues requires concerted efforts from industry stakeholders to create a more inclusive and supportive environment for women and ensure equal opportunities to succeed in the mining industry.

Initiatives to promote women's participation and empowerment in the mining industry. Various initiatives have been implemented in Ghana's mining industry to address the challenges faced by women and promote their participation and empowerment. These

initiatives included Women in Mining Ghana (WIM Ghana) and Ladies in Mining and Allied Professions in Ghana (LIMAP-GH).

- WIM Ghana strives to enhance and maintain women's employment in the mining industry and its supply chains, including artisanal and small-scale mining. WIM Ghana supports women's inclusion in sustainable development objectives and promotes gender equality, workers' rights and decent working conditions (WIM Ghana, 2024). WIM Ghana, established in 2011, aims to increase female representation in mining and contribute to Sustainable Development Goals 1, 5, 8 and 10 (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2018:2). The organisation advocates for improved workplace culture, talent access, innovation, reduced operational risk and community engagement (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2018:6; Peltier-Huntley & Weldegiorgis, 2022:35). It also calls for government initiatives such as reserving 15% of concessions, jobs and contracts for women (Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development, 2018:7).
- LIMAP-GH is a non-profit organisation that advocates women's empowerment in the mining and related industries. It provides mentorship, training and networking opportunities for women in mining (Yeboah, 2024). Founded in 2012, it encourages women's professional advancement in mining-related fields through mentorship programmes and awareness campaigns (Peltier-Huntley & Weldegiorgis, 2022:36).

These initiatives aim to create a supportive and inclusive environment for women, address their challenges and encourage them to pursue and advance their careers in the mining industry.

3.3.2 Rwanda

This section provides an overview of women's involvement in the Rwanda mining industry.

Overview of the mining industry. Mining in Rwanda dates back to the early 20th century, with significant mineral exploration occurring between 1920 and 1934. The country boasts many minerals and gemstones, including wolfram, cassiterite, gold, colombo-tantalite, lithium, beryl and rare earth minerals. Collaborating with the private sector, the Rwanda Mines, Petroleum and Gas Board is modernising mining operations through investments in equipment and techniques (Karitanyi, 2023). Rwanda's mining industry has undergone a significant transformation over the past few decades and has become a crucial component of the

country's economy. Mining in Rwanda primarily involves the extraction of tin, tantalum, tungsten and gold.

The sector is the second-largest source of export revenue after tourism, contributing significantly to the national GDP. Rwanda's mining industry contributed nearly US$800 million to the economy by 2022, showcasing its resilience and potential for growth (Louw, 2023). Ongoing exploration efforts continue uncovering new mineral deposits, further enhancing Rwanda's mining prospects (Louw, 2023).

The Covid-19 pandemic posed significant challenges to Rwanda's mining industry. Munir (2023) states that government-imposed mining suspensions in March 2020 had an adverse impact on the economy, particularly affecting vulnerable groups such as women. Munir (2023) highlights how mining closures forced women into sex work to support their families, whereas male wage workers sought alternative employment, leading to increased crime rates. Lack of access to healthcare was a significant issue due to inadequate facilities, and school closures caused the risk of early marriage and educational dropouts (Munir, 2023; Rushemuka & Côte, 2024:3).

Legislative framework. In many countries, such as Rwanda, the ILO Underground Work (Women) Convention 1935 (No. 45) (ILO, 1935) prohibits women from working in mines, mainly underground. Rwanda has made significant progress in promoting gender equality in its mining industry; however, challenges remain. The country's legal and policy framework encompasses several measures for encouraging women's participation in mining (Dusengemungu, *et al*., 2023:10599). Recent legislative changes have aimed to promote gender equality in the mining industry; key policies include the Rwanda Mining Policy, which aims to increase women's participation in the mining industry by 20 to 30% (Dusengemungu, et al., 2023:10599), while the 2010 National Gender Policy provides guidelines for incorporating gender into various sector-wide policies and programmes (Dusengemungu, et al., 2023:10599).

Furthermore, the Rwanda Mines, Petroleum and Gas Board has developed a gender strategy to promote the advancement of women in the mining workforce (Republic of Rwanda, 2021:13–14). This strategy includes removing barriers to women's participation, providing training and education, and ensuring safe and equitable working conditions (Republic of Rwanda, 2021). Despite these efforts, achieving true gender parity in the mining industry remains a work in progress, necessitating continued commitment and adaptation of policies to address ongoing challenges (Republic of Rwanda, 2021:13–14).

The primary legislation governing mining activities, Law No. 58/2018 of 13 August 2018 on Mining and Quarry Operations, does not explicitly address gender issues, but establishes a general framework for mining operations, encompassing environmental and social impact assessments and safety standards (De Schoutheete *et al*., 2024). Furthermore, it was established to safeguard workers' health and safety, increase productivity and promote gender equality in the mining industry (De Schoutheete *et al*., 2024). In addition, Law No. 006/2021 on Investment Promotion and Facilitation, which considers mining a priority sector, offers various incentives to investors, including those promoting gender equality (De Schoutheete *et al.*, 2024).

Women's representation and participation in the industry. Women's involvement in Rwanda's mining industry has been limited, with most working in formal and lower-paying positions. However, recent efforts have increased women's participation in various roles, including management and technical positions (Sabiiti, 2023). Women in the Rwandan mining industry are mainly involved in artisanal and small-scale mining. Munir (2021) refers to their involvement in these mining activities, such as panning, processing and trading goods and services around mine sites. Although the formalisation process in Rwanda shifted its focus to larger corporate enterprises, women continue to be heavily involved in the informal artisanal and small-scale mining industry, which provides essential income for their households (Munir, 2021). Efforts to empower women in the mining industry, including training and policy initiatives, are ongoing. However, most women's work remains within the small-scale and artisanal mining framework (McQuilken, 2020).

As of 2022, women represent 24% of the total workforce in Rwanda's mining industry (Forbes Africa, 2024). This increase is due to targeted policies and initiatives that promote gender equality. Among these women, 22% owned mining and quarrying businesses as shareholders and cooperative members, 20% as environmental officers, 23% as mining engineers and geologists, and 43% as field technicians (Rwanda Development Board, 2022).

Challenges women face in the mining industry. Despite decades of policies and initiatives to increase women's participation and representation in the mining industry, women are still subject to various challenges, such as discrimination and gender bias, lack of technical training, poor working conditions, work–life balance challenges, and safety and health risks (McQuilken, 2020; Munir, 2021, 2023).

Discrimination and gender bias. Women often face discrimination and gender bias, limiting their opportunities for advancement (McQuilken, 2020). Gender discrimination remains a pervasive issue in Rwanda's mining industry, where women frequently encounter biases at

excavation and mine sites that prevent them from engaging in lucrative activities (Munir, 2021). This discrimination is deeply rooted in traditional gender roles, compounded by a lack of institutional support (Munir, 2021).

Lack of technical training. Women have limited access to technical education and training in mining-related fields (African Development Bank, 2019; ILO, 2021b; Munir, 2021).

Poor working conditions. The mining environment is often not conducive to women's needs, especially for pregnant and breastfeeding women (ILO, 2021b).

Work–life balance challenges. Women in mining often have the double burden of domestic care work and mining duties, which affects their productivity and well-being (Munir, 2021). The absence of facilities and alternative placements for pregnant and breastfeeding women significantly decreases their representation in the mining industry (Munir, 2021). Furthermore, the lack of childcare centres at mine sites further restricts women's participation, highlighting a critical gap in support systems (Munir, 2021).

Safety and health risks. Due to inadequate protective measures and mining facilities, women are more vulnerable to safety and health concerns (Munir, 2021). The Covid-19 pandemic intensified these challenges, as women were disproportionately affected by employment losses as a result if social distancing measures. Many women, particularly those in lower-wage or part-time jobs, faced higher rates of job cuts and were more likely to work in industries severely affected by the pandemic, such as mining. Additionally, the closure of schools and childcare facilities placed an increased burden on women to manage caregiving responsibilities, further limiting their ability to maintain or secure employment (Munir, 2023).

Initiatives to promote women's participation and empowerment in the mining industry. The National Women's Council was established in 2011 to diversify economic activities for mining women and promote financial literacy. Women in the mining industry are establishing and managing savings groups with local best practices to increase their economic well-being (Rwanda Development Board, 2022).

3.3.3 Zimbabwe

This section contextualises Zimbabwe's mining industry and elaborates on women's representation.

Overview of the mining industry. Mining activities in Zimbabwe date back to the pre-colonial era, with modern mining operations beginning in the late 19th century following the European discovery of gold. The mining industry is highly diversified, producing nearly 40 minerals,

including platinum, gold, diamonds, coal and chrome. This sector has been a cornerstone of the country's economy, contributing significantly to the GDP and export earnings (International Trade Administration, 2022b).

Zimbabwe's mining industry has the potential to contribute approximately 12% of the country's GDP. If the government tackles continuous power shortages, foreign currency shortages and policy uncertainty, the industry was estimated to create US$12 billion annually by the end of 2023 (International Trade Administration, 2022b).

Despite its economic significance, women's participation in the mining workforce remains low, with women making up only about 10% of the artisanal and small-scale mining workforce and an even smaller percentage in large-scale mining operations (Mining Zimbabwe, 2023). In Zimbabwe, the artisanal and small-scale gold mining industry remains the primary employer and source of foreign exchange earnings, despite the country's economic downturn, which has disadvantaged many people (Ncube, 2021).

Legislative framework. In many countries such as Zimbabwe, women were prohibited from working in mines, more so underground, by the ILO Underground Work (Women) Convention, 1935 (No. 45) (ILO, 1935). Historically, Zimbabwe's mining legislation has restricted women's participation. For instance, the Mines and Minerals Act of 1961 did not explicitly prohibit women from working in mines, but created an environment that was not conducive to their participation due to cultural and social norms (Zhuwarara, 2021). This principal Act regulating mining activities includes provisions for environmental protection and sustainable development that have an indirect impact on women, particularly those engaged in artisanal and small-scale mining (Gonzi, 2022).

The Mines and Minerals Amendment Bill of 2021 seeks to simplify the mining title system and provide stronger environmental provisions. These provisions directly support women's participation by creating a more transparent and accessible mining environment (Huni, 2017:34).

The Indigenisation and Economic Empowerment Act of 2007, which aims to ensure local ownership, has been revised to include provisions that support women's participation in mining through community ownership schemes and local content requirements (Huni, 2017:39).

Women's representation and participation in the industry. Gender diversity and equality in the mining industry have progressed slowly. Historically, women were excluded from mining activities because of cultural norms and legislative barriers. Over the past few years, there has

been a gradual increase in women's participation; however, significant gaps remain (ILO, 2023).

Women in Zimbabwe's mining industry are predominantly involved in artisanal and small-scale rather than large-scale mining; their involvement in the mining industry is predominantly concentrated in artisanal and small-scale mining activities (WLSA, 2021). This trend is substantiated by various sources, including a report from the Pact Institute, which indicates that women constitute a significant portion of the artisanal and small-scale mining workforce (WLSA, 2021). In large-scale mining, the representation of women is minimal. Globally, women hold only 10% of senior management positions in mining companies, and in Zimbabwe, they constitute only 2% of the mining workforce, primarily in administrative roles (ILO, 2023).

Challenges women face in the mining industry. Women in Zimbabwe's mining industry face several obstacles that hinder their success and progress. Despite decades of policies and initiatives to increase women's participation and representation in the mining industry, they continue to face various challenges, including cultural and social barriers, financial barriers, workplace discrimination and harassment, lack of training and education, regulatory and bureaucratic challenges, and health and safety concerns (Chimoio, 2022; Chinembiri, 2019; Makaza & Chimuzinga, 2020; Matiashe, 2022).

Cultural and social barriers. Traditional gender norms and societal expectations discourage women from entering the mining domain, particularly in rural settings, where women are predominantly assigned familial caretaking roles (Matiashe, 2022). Traditional gender roles and societal expectations often hinder women from pursuing mining careers (ILO, 2023; Makaza & Chimuzinga, 2020).

Financial barriers. Women often lack the resources to start or expand mining operations, limiting their opportunities (Chimoio, 2022; ILO, 2023; Makaza & Chimuzinga, 2020).

Workplace discrimination and harassment. Women in mining frequently face gender-based violence, harassment and discrimination, which can deter them from entering or remaining in the sector (ILO, 2023; Makaza & Chimuzinga, 2020). Furthermore, the mining industry is subjected to workplace harassment and discrimination, resulting in women being subjected to verbal abuse, hindering their professional endeavours (Matiashe, 2022).

Lack of training and education. The pipeline for women with technical and engineering backgrounds is limited, decreasing their opportunities for advancement in the mining industry (ILO 2023). Educational disparities also restrict women's prospects in mining, as they

encounter limited access to technical training and struggle to secure funding for equipment and technology, particularly in artisanal and small-scale mining endeavours (Weldegiorgis *et al.*, 2018:16).

Regulatory and bureaucratic challenges. Women often experience difficulty obtaining mining licences and navigating regulatory requirements, which is exacerbated by corruption and bureaucratic inefficiency (ILO, 2023; Makaza & Chimuzinga, 2020).

Health and safety concerns. Women working in the Zimbabwean mining industry face a range of critical health and safety challenges. Inadequate PPE is a significant concern, as women often struggle with PPE that is not designed to accommodate their physiological differences, such as smaller sizes of gloves, boots and helmets. This mismatch increases the risk of injuries and compromises overall safety (Matiashe, 2022). The absence of sex-specific facilities exacerbates their discomfort and safety concerns, as women struggle with inadequate facilities, such as washrooms and changing rooms (Matiashe, 2022).

In addition, the lack of appropriate and sanitary ablution facilities for women poses severe health risks, leading to poor hygiene, heightened risk of infections and significant discomfort (Matiashe, 2022). Sexual harassment and gender-based violence also remain pervasive issues, with women experiencing verbal abuse and inappropriate advances, which not only have an impact on their mental health, but also undermine their safety and job performance (ILO, 2023; Makaza & Chimuzinga, 2020). Furthermore, health risks related to mining conditions are prevalent, with female miners exposed to respiratory issues from dust and poor ventilation, compounded by a lack of tailored medical care and support (Makaza & Chimuzinga, 2020). Addressing these challenges is crucial for improving women's health, safety and overall well-being in the mining industry.

Despite these adversities, the Zimbabwe mining industry offers a glimmer of hope by fostering a supportive environment and avenues for career progression exclusively for women. Advocacy for government policies promoting equal employment opportunities and support for women in mining signifies a collective effort towards addressing these systemic inequities (McKinsey & Company, 2021b).

Initiatives to promote women's participation and empowerment in the mining industry. The Mthandazo Women in Mining Service Center, established in 2006, brings together women gold mining workers. The centre has contributed significantly to the community, providing assistance, equipment and services that have improved citizens' homes, livelihoods and educational experiences (WLSA, 2021:13). The centre was established in Collen Bawn,

Gwanda District, Matabeleland South Province, in collaboration with the United Nations Development Programme and the Ministry for Women, Gender, and Community Development (United Nations, 2022). The centre also offers opportunities for women to exchange information and experiences, promote their products and improve their mining operations (United Nations, 2022). To enhance women's empowerment, the centre aims to use its revenue to establish a stamp mill for the surrounding community to empower more women (United Nations, 2022).

3.3.4 Reflection of the African overview of women employed in mining

In conclusion, examining women's involvement in the large-scale mining industry across Ghana, Rwanda, and Zimbabwe underscores both the progress and the persisting challenges.

Despite legislative frameworks supporting gender equality and women's participation in mining in Ghana, cultural barriers and societal expectations continue to hinder women's advancement in the sector. While women constitute a substantial portion of the artisanal and small-scale mining workforce, their representation in large-scale mining remains relatively low. Challenges such as limited access to childcare facilities, inflexible work arrangements and gender-based discrimination persist, contributing to the high turnover rates among women in the sector. However, initiatives such as the National Gender Policy and organisations such as WIM Ghana and LiMAP-Gh strive to promote women's participation and empowerment through advocacy, mentorship programmes and awareness campaigns.

Similarly, in Rwanda, efforts to promote gender equality in the mining industry have been made through legislative and policy frameworks, including the National Gender Policy and the Rwanda Mines, Petroleum and Gas Board's gender strategy. Despite these efforts, women in Rwanda's mining industry face challenges, such as gender discrimination, lack of support systems and the impact of the Covid-19 pandemic. Most women's participation remains in the informal artisanal and small-scale mining industry, highlighting the need for targeted interventions to address systemic barriers and promote women's empowerment.

Although women play a significant role in artisanal and small-scale mining in Zimbabwe, their representation in large-scale mining is limited. Cultural and societal barriers, workplace harassment and inadequate facilities pose obstacles to women's success and advancement in this sector. Initiatives such as the Mthandazo Women in Mining Service Center aim to address these challenges by providing support, equipment and services to women miners and fostering a supportive environment for their participation and empowerment.

While progress has been made in promoting women's participation in the mining industry across these African countries, concerted efforts are needed to overcome persistent challenges and ensure gender equality and empowerment in large-scale mining operations. Collaboration among governments, mining companies, civil society organisations and international partners is essential to address systemic barriers and create inclusive and supportive environments for women in the mining industry.

The following section provides an overview of women's participation in South Africa's mining industry.

3.4 A NATIONAL OVERVIEW OF WOMEN EMPLOYED IN THE MINING INDUSTRY

This section provides an overview of women's involvement in South Africa's mining industry. The section covers the following topics:

- Overview of the mining industry
- Legislative framework
- Women's representation and participation in the industry
- Challenges women face in the mining industry
- Initiatives to promote women's participation and empowerment in the mining industry.

Overview of the mining industry. The South African mining industry contributes enormously to the country's economy (Minerals Council South Africa, 2022). The country's stock market was established in Johannesburg in 1887, 10 years after the first diamonds were found along the Orange River, almost simultaneously with the renowned Witwatersrand gold rush (Minerals Council South Africa, 2022). Although gold, diamonds, platinum and coal are the most well-known minerals and metals produced in South Africa, the country also has chrome, vanadium, titanium and a variety of other minor minerals (Minerals Council South Africa, 2022; Wits Mining Institute, 2024). According to data from the South African Department of Mineral Resources and the United States Geological Survey, South Africa has more than US$2.5 trillion in mineral reserves, with 16 commodities ranking in the top 10 globally (Wits Mining Institute, 2024). South Africa has the world's largest deposit of platinum-group metals (88%), manganese (80%), chromite (72%) and gold (13%). The country ranks second in the production of titanium minerals (10%), zirconium (25%), vanadium (32%), vermiculite (40%) and fluorspar (40%). Furthermore, the nation holds 17% of the world's antimony reserves (Wits Mining Institute, 2024). In 2022, mining contributed to approximately 7.53% of the country's GDP (Maleke, 2023).

The Covid-19 pandemic had a significant impact on the mining industry, leading to temporary operational shutdowns and disruptions in supply chains. The International Trade Administration (2022c: iv), contends that the Minerals Council in their publication titled "Economic impact of COVID-19 lockdown on the SA economy", stated that the mining industry employs many people in many different places. At least two extra jobs are produced in linked industries for every direct mining position, and each mining employee supports between five and ten dependants. According to the International Trade Administration (2022c: iv), given mining's centrality in South African communities, there is a belief that the sector will continue to be critical in addressing the country's triple concerns of poverty, unemployment and inequality.

Legislative framework. According to Benya (2017b:510), South African regulations previously barred women from working in industries such as mining. Before women were prohibited from working underground, some mines allowed them to work on the surface. Surface duties included sorting copper ore for bagging, nursing, administration and training management (Benya, 2016:143–147; Ralushai, 2003:24–25). The Mines and Works Act 12 of 1911 prohibited the employment of boys under the age of 16 or of any female in the mining industry (Benya, 2017a:80). Women were subsequently banned from working underground by the South African Minerals Act of 1991, which was enacted 80 years later (Khoza, 2015:2; Ralushai, 2003:26–27). The previous discriminatory legislation was eliminated only once the democratic government took power in 1994. Women gained the legal right to work underground in the mining industry only when the (MHSA of 1996 was passed (Ralushai, 2003:26).

The Constitution of the Republic of South Africa (1996) and the Bill of Rights (Chapter 2 of the Constitution) challenged the South African Minerals Act of 1991 (Ralushai, 2003:26). These laws set the foundation for democracy and legitimised subsidiary legislation. As part of South Africa's gender equality policy regime, Section 9 of the Constitution promotes gender justice at work and in society (Botha, 2013:109).

Furthermore, the MHSA 29 of 1996 played a pivotal role in dismantling barriers that previously prohibited women from working underground in the mining industry, as highlighted by Ranchod (2001:22). To redress historical disparities in the mining industry and to enhance women's participation, the MPRDA 28 of 2002 was enacted (RSA, 2002b:12). Notably, both the MHSA and the MPRDA represented pioneering legislation that opened up opportunities for women to work in underground mining, as underscored by Benya (2017a:83).

The implementation of the MPRDA in 2004 coincided with introducing the first Broad-based Socio-economic Empowerment Charter, commonly known as the Mining Charter. The primary objective was to foster a sector that proudly embodied the principles of non-racial South Africa. Subsequently, the amended Mining Charter of 2010 sought to refine and strengthen its transformative impact (RSA, 2004:6, 2010a:1).

The latest iteration of the Mining Charter, established in 2018, introduced a set of requirements that included a commitment to include women in influential decision-making roles and broader gender inclusivity. Specifically, the Charter mandates that women make up a minimum of 20% of the top management team, at least 25% of the senior management team, a minimum of 25% of the middle management team and a minimum of 30% of the junior management team, as articulated by the DMRE in 2018 (RSA, 2018:22). For a comprehensive examination of both labour legislation and mining policies, refer to Chapter Four.

Women's representation and participation in the industry. Despite efforts to promote gender diversity and equality in the mining industry, women's representation remains inadequate, particularly in large-scale mining operations. Historically, the mining industry has been male-dominated, with women facing various barriers to entry and advancement (Mashaba & Botha, 2023:16). In August 2023, the MQA (2023:11) reported that women accounted for 19.2% of employees in the South African mining industry, equating to 98 730 women in the mining labour market profile. Notwithstanding the goal of the Mining Charter to increase women's participation in the industry and advancement into managerial positions, women continue to be a minority in core mining activities (Botha, 2017:16; Mahlasela *et al*., 2023:7). Women in the South African mining industry work in artisanal and small-scale mining, as well as in large-scale mining (Mashaba, 2022:101; Peltier-Huntley *et al*., 2022:1).

Challenges women face in the mining industry. Despite decades of policies and initiatives to increase women's participation and representation in the mining industry, they face various challenges, particularly in large-scale mining operations. These challenges include gender discrimination and bias, workplace culture and environment, work–life balance challenges, health and safety concerns, limited career advancement opportunities and lack of role models and representation (Botha, 2016; Gertse, 2024; Mangaroo-Pillay, 2018; Mashaba, 2022; Mashaba & Botha, 2023; Moalusi & Jones, 2019; Mudimba, 2017; Muponde, 2021; Peetz & Murray, 2011; Roos, 2014; Zungu, 2013).

Gender discrimination and bias. Women in mining often face prejudice and discrimination, including stereotyping, harassment and inadequate treatment in recruitment, promotion and career advancement opportunities (Mashaba & Botha, 2023). In addition, women have to work

hard to prove their worth in a male-dominated workplace because they are seen as ‘quotas’ by men who view them as inferior (Benya, 2017a:92–108; Botha & Cronjé, 2015c:31–53).

Workplace culture and environment. Men have dominated the mining industry, and some workplaces and environments may be perceived as unwelcoming or hostile towards women. This can contribute to feelings of isolation and lack of support (Mashaba & Botha, 2023; Muponde, 2021). Furthermore, women are often subjected to sexual harassment in the form of profanity, rape and quid pro quo sexual harassment (exchange of sexual favours) (Muponde, 2021).

Work–life balance challenges. The nature of mining work, such as shift work, long hours and remote locations, can make it challenging for women to balance their professional and personal duties, particularly those with caregiving roles (Gertse, 2024; Mashaba & Botha, 2023; Muponde, 2021).

Health and safety concerns. Women in mining operations may experience distinct health and safety risks, such as inadequate PPE designed for men, lack of gender-specific facilities and potential exposure to gender-based violence (Mashaba & Botha, 2023; Muponde, 2021). Furthermore, women’s occupational health and safety are jeopardised by a lack of suitable and readily available hygienic ablution facilities. Moreover, women are often required to use equipment and tools created for men (Benya, 2016; Mangaroo-Pillay, 2018; Mashaba, 2022; Mashaba & Botha, 2023).

Limited career advancement opportunities. Women in mining often face obstacles to career advancement, including a lack of mentoring, networking opportunities and access to training and development programmes (Mashaba & Botha, 2023).

Lack of role models and representation. The absence of visible role models and mentors for female professionals in the mining industry can lead to a lack of visible role models, mentors and career development support, hindering promotion into managerial positions (Mashaba & Botha, 2023; Muponde, 2021).

Over time, women have faced various hurdles and restrictions as they have gradually become formal participants in all facets of the mining industry’s operations (Minerals Council South Africa, 2020:1). However, the industry has improved its ability to recognise and address these challenges, allowing more women to work underground (Minerals Council South Africa, 2020:1).

Initiatives to promote women's participation and empowerment in the mining industry. The following initiatives were implemented in South Africa to promote women's participation and empowerment in the country's mining industry: the Mining Charter, Women in Mining South Africa (WIMSA), International Women in Mining (IWIM), the Minerals Council, South Africa's Women in Mining Leadership Forum, and the MQA.

- The South African Mining Charter (2018) introduced targets and requirements for mining companies to increase female representation in ownership, management and employment (Hayes, 2022).
- WIMSA is a non-profit organisation that promotes women's advancement in the mining industry and provides support, mentorship and networking opportunities. In the South African mining industry, WIMSA provides a free platform to support and guide women to achieve personal and professional success and develop their leadership skills and careers. The organisation was founded in 2010 as a completely independent, volunteer-run, non-profit organisation (De Klerk, 2012:11; WIMSA, 2023). The organisation seeks to mobilise women into becoming active participants in the mining industry by bringing attention to the unique needs of women in the industry, establishing their needs, supporting them in becoming more visible in the sector and providing training for women to equip them with the necessary skills (Peltier-Huntley, 2022). As a result of the existence of organisations such as these, women's concerns are being addressed.
- IWIM is an international organisation that strives to promote women's participation in the mining industry globally, including initiatives in South Africa (Peltier-Huntley *et al*., 2022).
- The Women in Mining Leadership Forum in the Minerals Council, South Africa, is a platform for women leaders in the mining industry to share experiences, discuss challenges and develop strategies for advancing gender diversity and inclusion (Peltier-Huntley *et al*., 2022).
- The MQA is a sector education and training organisation that has implemented programmes and initiatives to promote women's participation in mining-related education and training (Mashaba & Botha, 2023).

From the above, it is clear that historical barriers, legislative reforms and ongoing efforts towards gender equality and empowerment mark the narratives of women's involvement in the South African mining industry. Initially excluded by discriminatory legislation, women steadily gained access to various roles in the industry, particularly following legislative changes in the mid-1990s. Despite progress, challenges persist, including gender bias, safety

concerns and limited career advancement opportunities, which are further elaborated on in section 3.5, and a linkage is provided on how they affect the working conditions of women in mining. The following section provides an overview of the factors affecting the working conditions of the women employed in mining.

3.5 FACTORS AFFECTING THE WORKING CONDITIONS OF WOMEN EMPLOYED IN THE MINING INDUSTRY

The above section showed that cultural and organisational norms in the mining industry have contributed to the underrepresentation of women in mining and their working conditions. The mining industry has not always been, and is still not, perceived as a prominent and preferred career choice for women (Jeffrey *et al*., 2018:3). Dooley and Erhart (2023:673) contend that there is still a perception that the mining industry is not conducive to women to work. This is because of the existing barriers and factors affecting the working conditions of women in mining (Botha & Cronjé, 2015c:15; Dooley & Erhart, 2023:673). It is challenging for them to integrate into a traditionally male-dominated sector (Mashaba, 2022:107). In addition, the experiences of women currently employed in the industry may encourage or discourage future women who desire to work in mining (Kaggwa, 2019:1). The following subsections examine the factors that affect the working conditions of women employed in mining operations.

3.5.1 Gender and cultural stereotypes and biases

Women's relegation to domestic roles and the perpetuation of the stereotype of women as breadwinners, while men are viewed as primary earners, have led to a notable underrepresentation of women in mining operations (Benya, 2009:27; Fernandez-Stark *et al*., 2019:6–7; Zhou, 2022:208). Stereotypes depicting women as too weak and unfit for mine labour persist, impeding their acceptance in the sector (Benya, 2009, 2016; Emslie & Hunt, 2008; Martin & Barnard, 2013:7). These gender biases, defined by the United Nations as 'generalised perceptions of gender roles and attributes', contribute to the exclusion of women from mining workplaces (United Nations, 2014). Historical stereotypes labelling women in mining as lazy and incompetent further alienate them from the industry (Benya, 2009:79–80; Mashaba & Botha, 2023:4). Consequently, women are perpetually marginalised, threatened with exclusion and face significant challenges to their inclusion in the mining industry (Mashaba & Botha, 2023:4; Thiart *et al*., 2023:6). These are challenges seen in countries such as Brazil and the UK, as discussed in sections 3.2.2 and 3.2.4.

Furthermore, *c*ultural stereotypes deeply entrenched in societal perceptions continue to perpetuate discrimination against women in hiring and promotion in the mining industry

(Benya, 2016:243; Keck & Powell, 2006). These stereotypes indicate that women are inherently less capable or suitable for roles in the industry, further exacerbating gender disparities. In addition, prevailing cultural norms and beliefs shape perceptions of women's roles, often restricting their entry into specific professions in the mining industry (Letlape, 2014:33). These barriers not only limit opportunities for women, but also reinforce the gender imbalance that persists in the industry, hindering progress towards greater gender diversity and equality. These challenges are observed in Zimbabwe and Ghana, as discussed in sections 3.3.1 and 3.3.3.

Traditional gender roles continue to influence women's struggles in balancing work and personal life, as caregiving and domestic duties often clash with professional demands (Mashaba & Botha, 2023:4; Moalusi & Jones, 2019:5). Moreover, community attitudes and values contribute to negative perceptions, fostering biases and unfair treatment of women (Moalusi & Jones, 2019:6). Societal norms, shaped by traditional practices and local customs, hinder women's participation in male-dominated sectors, such as mining. In addition, adherence to these gender roles can strain marital relationships, especially when women's involvement in the workforce conflicts with societal expectations (Ofosu *et al*., 2024:2–18). These are challenges seen in countries such as Rwanda and Ghana, as discussed in sections 3.3.1 and 3.3.2.

3.5.2 Work–life balance

Mining work presents significant challenges to achieving work–life balance, which has a particular impact on women, who often manage additional responsibilities at home, resulting in gender discrepancies in career progression (Mahasha, 2016:1; Owusu-Poku, 2014:1). Women in the workforce are expected to navigate the division of their time between paid and unpaid domestic duties (ILO, 2021a:23). Research indicates that female miners typically work longer hours, including night shifts, than their male counterparts, leading to a loss of vital family time (Abrahamsson *et al*., 2014:20). Shift systems inherent in mining operations further impede women's involvement in the industry (Botha, 2013:181). Achieving work–life balance, crucial for employee well-being, remains challenging in mining, particularly for women who bear familial responsibilities (Mashaba, 2022:111). These challenges are seen in countries such as Australia, Brazil, Canada and the UK, as discussed in section 3.2; Ghana, Rwanda and Zimbabwe, as discussed in section 3.3; and South Africa, as discussed in section 3.4.

3.5.3 Workplace culture

Workplace culture, defined as a set of values, norms and beliefs that influence behaviour, plays a pivotal role (Ledwaba, 2017:61). Studies have revealed that male-dominated mining cultures resist integrating women, viewing them as disruptive to the established macho environment (Benya, 2009). Ledwaba (2017:61–62) uncovered disparities in treatment between male and female miners, with women often not taken seriously by their supervisors. Furthermore, the prevailing organisational culture in mining companies hinders women's full integration, detracting from the sector's appeal and dissuading women from pursuing mining careers (Ledwaba, 2017:61). These challenges are seen in countries such as Canada, as discussed in section 3.2.3, and in South Africa, as discussed in section 3.4.

3.5.4 Recruitment and selection

Peetz *et al*. (cited by Fernandez-Stark *et al*., 2019:6–7) argue that women's avoidance of the mining industry stems from their apprehension of societal criticism of deviating from established gender norms. Subtle factors, such as micro-inequities, inherent biases and women's educational choices, continue to shape recruitment and selection processes in the mining industry (MiRH, 2016b). Consequently, gender-related challenges during recruitment adversely affect the working conditions experienced by women in mining. Furthermore, mines encounter difficulties identifying potential female recruits, as fewer women pursue relevant mining qualifications than men (Mashaba, 2022:85).

3.5.5 Job segregation

Job segregation exacerbates the challenges faced by women in the workforce (Ledwaba & Nkomo, 2021). Ledwaba and Nkomo (2021) underscore how job segregation relegates women to lower-paying, less-skilled roles, compounding these challenges.

3.5.6 Disparities in access to essential benefits

Disparities in access to essential benefits exacerbate the challenges faced by women in the workforce (Ledwaba & Nkomo, 2021). Unequal access to benefits such as health insurance, retirement plans and paid leave undermines the job security and overall well-being of women (Botha, 2013:152; Mashaba & Botha, 2023:3).

3.5.7 Wage disparities

Wage disparities persist in the mining industry, disproportionately affecting women who frequently earn less than their male counterparts (ILO, 2018; Mashaba, 2022:107–108). These

discrepancies undermine women's financial stability and contribute to lower job satisfaction levels (ILO, 2021a; Mabaso, 2023).

3.5.8 Career development

The term 'career development' refers to empowering employees by providing them with training and development opportunities to become more proficient and capable of getting promotions. In addition, they can place employees in positions aligned with their career interests, needs and aspirations (Martin & Barnard, 2013; Mashaba, 2022). Women in mining face the following career development challenges: recruitment and selection, training and development opportunities, career guidance and mentoring, and a glass ceiling (Botha, 2013; DMR, 2015; Martin & Barnard, 2013; Mashaba, 2022).

Training and development are crucial for women's career progression in the mining industry (Mashaba, 2022:108). Effective training programmes must align with the interests, needs and career aspirations of employees, as emphasised by Ledwaba (2017:60). This requirement is supported by legislative frameworks such as the EEA, the Skills Development Act and the 2018 Mining Charter (Mashaba, 2022:108–109). Research by Moyo (2011:61) on women's involvement in mining highlights that limited access to skills development and training and a lack of targeted bursaries and scholarships for women impede their participation. This lack of development opportunities adversely affects employee morale and professional growth (Mashaba, 2022:110). Mahlasela *et al.* (2023:6) found that despite equal benefits, women perceived discrimination and disparities in leadership opportunities, with promotions and high-level positions predominantly reserved for men. This discrepancy in training and promotion opportunities reinforces the perception of mining as a male-dominated field, exacerbating female retention challenges (Mashaba, 2022:109). Addressing these issues through tailored career development programmes for women is essential to reduce turnover and promote gender diversity, as observed in various countries, including Australia, Rwanda and South Africa, as discussed in sections 3.2.1, 3.3.2 and 3.4.

Career guidance and mentoring are vital components for the advancement of women in the mining industry (Mashaba, 2022:108). Hughes (2012) advocate for the importance of career counselling, childcare support, a healthy work environment and access to mentors as mechanisms to help women overcome barriers in the mining industry. These measures are essential for addressing issues such as identifying personal strengths, challenging stereotypes and tackling sexual harassment.

The glass ceiling represents a significant challenge for women in the mining industry, reflecting the systemic barriers that prevent women and minorities from advancing to higher organisational positions (Khoza, 2015:25). Often, job openings and promotional opportunities are communicated primarily to men, hindering women's chances for advancement. This phenomenon perpetuates the marginalisation of women and reinforces the male-dominated career progression model (MiHR, 2016a:2). Consequently, women face substantial obstacles in breaking through these invisible barriers, which has an impact on their career development and progression in the mining industry.

3.5.9 Structural factors

In the mining industry, structural factors refer to physical and organisational components that influence conditions and working environments for women (Amponsah-Tawiah *et al*., 2023:296). Structural factors significantly shape women's working conditions and professional experiences in the mining industry; various factors contribute to the mining industry's work environment, including intangible and tangible elements (Botha, 2013; WIMSA, 2023; Zungu, 2013:8). Critical considerations include changing houses, housing, childcare facilities, remote mining locations, transportation and policies (Botha, 2013; Keck & Powell, 2006).

Challenges persist with the provision of adequate facilities, which affect women's access to mining sites (Abrahamsson *et al*., 2014; Benya, 2009:18). Ensuring proper facilities and changing houses to preserve privacy, protection and dignity is essential (Badenhorst, 2009:61). Female employees require separate spaces for washing and changing, with toilets meeting international standards (Botha, 2013:182; Keck & Powell, 2006; Zungu, 2013:12). Providing adequate and well-designed facilities can enhance the comfort and safety of female employees (Botha, 2017:18).

The scarcity of sufficient accommodation in mining settlements in South Africa underscores the importance of addressing housing challenges (RSA, 2010a:4). Providing adequate and well-designed accommodation can enhance the comfort and safety of women employees (Botha, 2017:18).

The absence of adequate childcare facilities (Abrahamsson *et al*., 2014; Benya, 2009:18) places significant burdens on women, especially single mothers who are responsible for caregiving. No formal childcare options are available in the community, forcing families to depend on informal assistance from relatives or local babysitters (Keck & Powel, 2006:286). Supportive childcare policies are essential for fostering family-friendly workplaces (King-Abadi, 2018).

Remote mining locations pose unique challenges, particularly for women miners, affecting their well-being and job satisfaction (Abrahamsson *et al.*, 2014). Transportation to and from mining sites involves logistics, emphasising the importance of safe and reliable transportation options. Providing adequate transportation can enhance the comfort and safety of women employees (Botha, 2017:18).

Workplace policies that foster equality, non-discrimination, transparent career progression and work–life balance play a crucial role in shaping women's experiences. Access to training and development opportunities further supports professional advancement, leading to a diverse and resilient workforce (Botha, 2013; Ledwaba, 2017). Nonetheless, challenges remain in providing women access to mining sites, primarily due to insufficient facilities and childcare options (Abrahamsson *et al*., 2014; Benya, 2009:18). These issues are evident in countries such as Brazil and the UK, as discussed in sections 3.2.2 and 3.2.4, as well as in Ghana, discussed in section 3.3.1.

3.5.10 Health and safety

According to Zungu (2011:8), work in the mining industry is classified as high-risk and falls under the category of dangerous work. Zungu (2011:8) maintains that mining entails strenuous physical labour in significant discomfort, deafening noise, excessive heat and humidity, and confined quarters. Health and safety factors are critical for the well-being and protection of those working in occupational settings, especially women (Benya, 2009, 2016; Botha, 2013). The following health and safety factors affect the working conditions of women employed in mining operations: psychological issues, physical issues, PPE, sexual harassment, pregnancy and breastfeeding (Benya, 2009, 2016; Botha, 2013; Keck & Powell, 2006; Mashaba, 2022; Moalusi & Jones, 2019; Zungu, 2011).

Women employed in the mining industry often face various psychological challenges stemming from work-related stress, difficult working conditions, gender discrimination, sexual harassment and work–life balance issues (Bailey-Kruger, 2012:4; Botha, 2017:20–21; Rubin *et al*., 2017:400–411). Schein (2001:675) suggests that psychological barriers can arise from motives, emotions, social values and differing perceptions. Motives, such as personal ambitions or desires, can be shaped by social conditioning that discourages women from pursuing careers in traditionally male-dominated fields such as mining (Schein, 2001:675). Emotions, including fear of failure or lack of confidence, often stem from past experiences or societal expectations that women are less capable in these roles (Schein, 2001:675). Social values play a significant role, as ingrained cultural norms and biases reinforce the idea that mining is unsuitable for women, thereby limiting their participation and progression (Ely &

Meyerson, 2021). Differing perceptions between genders also contribute to psychological barriers; for instance, men and women may perceive the challenges and rewards of a mining career differently, with women potentially seeing more obstacles due to societal pressures and discrimination (Fitzgerald & Cortina, 2018). These psychological barriers are reinforced through a combination of personal experiences and broader cultural messages, making it essential to address both individual and societal levels to promote gender equality in the mining industry. A significant obstacle women face in production mining roles is the perception that they are less suited to physically demanding tasks than men (Fernandez-Stark *et al*., 2019:6). Consequently, female miners may experience acute and chronic stress reactions due to their presence in predominantly male-dominated workplaces.

Mining is a physically demanding profession, particularly in underground environments, requiring extensive training and a high level of physical strength and endurance (Keck & Powel, 2006:286; Mashaba, 2022:98). Equipment and tools, essential components of mine work, are typically designed to accommodate men's size and strength (Zungu, 2011). Consequently, mining tasks often result in back injuries and musculoskeletal disorders among workers (Badenhorst, 2009:63). In general, women have lower manual material-handling capabilities than men, necessitating that female miners maintain a robust fitness level to perform daily tasks and establish credibility among their colleagues (Botha, 2013:185–187). However, physiological differences between men and women can result in severe strain during manual labour, resulting in the risk of back injuries and musculoskeletal disorders (Tawiah *et al.*, 2015:1–9). Mining equipment, mainly designed for men, often poses challenges for women due to differences in body size, necessitating the use of shared equipment (Botha & Cronjé, 2015b:661).

Women typically work closer to their aerobic capacity and have lower manual material-handling capabilities, leading to increased fatigue and reduced productivity compared to men (Botha, 2013: 185–187). These high levels of fatigue increase the risk of accidents and injuries, highlighting the importance of addressing gender-specific considerations in mining operations. These challenges are evident in countries such as Canada, as discussed in section 3.2.3.

The mining industry's PPE has traditionally been tailored to fit men, reflecting the sector's historical perception as a predominantly male domain (Botha, 2013:183). However, women have distinct size and shape characteristics, necessitating the adaptation and development of protective gear to suit their needs (Benya, 2016:226). With shorter and narrower feet, shorter bodies, narrower shoulders and broader hips compared with men, ill-fitting PPE poses significant challenges for women, which impact their safety and job performance (Zungu,

2011). Inadequate PPE hampers mobility and exposes workers to environmental hazards inherent in mining operations, underscoring the importance of tailored protective gear for women (Benya, 2016:266–267; Botha, 2013:183–184). Manufacturers should prioritise the provision of correctly fitted PPE to ensure the safety and well-being of all mining personnel, including women (Badenhorst, 2009:62; Steenkamp, 2021).

The mining industry in South Africa is experiencing a shift towards women, particularly in underground positions, which has led to challenges in providing suitable PPE (DMRE, 2023:3). The Safety in Mines Research Advisory Committee project suggests a link between women's PPE and increased susceptibility to skin conditions, including contact dermatitis, chafing and infections (DMRE, 2023:3). Hlubi (2024) also highlights these issues, emphasising the need for gender-specific PPE to ensure safety and comfort. Guidelines for PPE provision for women in mining are being developed, considering ergonomic and comfort aspects beyond hazard identification and risk assessment. Essential PPE should include protection for the head, eyes, ears, face, hands, arms, body, feet and respiratory system as well as vibration and thermal protection (DMRE, 2023:3). Improvements in this area are noteworthy. According to the MHSC (2015:6), some mines are piloting projects where limited manufacturing of women's PPE is being implemented. These challenges are seen in South Africa, as discussed in section 3.4.

Sexual harassment in the mining industry encompasses various forms, including physical, verbal and non-verbal behaviours of a sexual nature, such as unwanted physical contact, verbal abuse, non-verbal gestures or quid pro quo harassment (South African Labour Guide, 2021). Shockingly, the Minerals Council of South Africa (2019:3) has documented instances of women being subjected to rape, solicited for sexual favours in exchange for employment or benefits, and even murdered underground. Verbal, physical and quid pro quo harassment are everyday experiences for women working in and around mines, often exacerbated by the prevalent use of foul language and inappropriate behaviour by male colleagues, particularly in confined spaces such as crowded cages (Botha, 2016:9). The study conducted by Nkosi *et al*. (2022) substantiates these findings. It highlights the pervasive culture of harassment and the severe impact it has on women's mental and physical health in the mining industry. Moreover, women face heightened risks of sexual harassment during night shifts (Khoza, 2015:67). Despite these challenges, sexual harassment incidents are often underreported because of intimidation and a lack of follow-up on complaints, highlighting systemic issues in addressing workplace harassment (Khoza, 2015:67). These challenges are seen in all countries discussed in sections 3.2, 3.3 and 3.4.

The integration of women into the mining industry presents unique challenges, particularly regarding pregnancy. South African law provides special protection for pregnant employees,

explicitly prohibiting unfair discrimination based on pregnancy under the Constitution of South Africa, Section 9(3), and the EEA, Section 6 (RSA, 1996a:1245, 1998a:7). However, women's reluctance to disclose pregnancy poses concerns for mining firms, as pregnant employees may pose health and safety risks in mining operations (Botha & Cronjé, 2015b:4). Concerns regarding job continuation and maternity benefits further compound these issues (Badenhorst, 2009:69; Botha & Cronjé, 2015a:4). Recent studies corroborate these findings, indicating that fear of job loss or career stagnation leads many women to conceal their pregnancies (Arena, *et al*, 2023:52-84). To address these challenges, mining companies have implemented systematic alternate placement approaches to accommodate pregnant employees (Badenhorst, 2009:69; Botha & Cronjé, 2015b:4). While many women can continue to work during pregnancy, the nature of their job and the associated hazards affect their ability to do so (Badenhorst, 2009:69; Botha & Cronjé, 2015a:4). Legislation such as the EEA of 1998 and PEPUDA 4 of 2000, which prohibit workplace discrimination and promote human dignity, further underscores the importance of addressing pregnancy-related issues in the mining industry. Furthermore, the Code of Good Practice on the Protection of Employees during Pregnancy and after the Birth of a Child aims to safeguard pregnant and post-pregnant employees (RSA, 1998b).

Breastfeeding poses significant challenges for women employed in the mining industry, particularly because of the limited access to appropriate facilities for expressing milk or nursing infants during work hours (Botha & Cronjé, 2015a:4). This logistical challenge often hinders breastfeeding mothers from returning to work or forces them to compromise their breastfeeding goals (Badenhorst, 2009:69). Furthermore, the physical demands inherent in mining may clash with the needs of breastfeeding mothers, necessitating thoughtful workplace adjustments to safeguard their health and well-being (Botha & Cronjé, 2015b:4). Recent studies further emphasise these points, highlighting that inadequate breastfeeding facilities and support remain significant barriers. For instance, the lack of supportive policies and facilities for breastfeeding in male-dominated industries has a significant impact on women's career continuity and health outcomes. Similarly, Badenhorst (2009:69) argues that addressing these needs is crucial for promoting gender equality and improving the overall working environment in mining. Overcoming these challenges requires fostering a supportive environment that prioritises the needs of breastfeeding employees, thereby contributing to gender equality and the overall success of the mining industry (Badenhorst, 2009:69). This challenge is explicitly mentioned in the discussion of Ghana in section 3.3.

3.5.11 Conclusion

This section examined the complex factors affecting women's working conditions in the mining industry, highlighting ongoing challenges despite some progress. Addressing these multifaceted challenges requires collaborative efforts from all stakeholders, including mining companies, policymakers and social leaders. Comprehensive strategies to promote gender equality, enhanced training and career development opportunities, improved workplace facilities and robust mechanisms to combat discrimination and harassment are essential. Only through such systemic changes can the mining industry become an inclusive environment where women can thrive and contribute to the industry's growth and development.

3.6 CHAPTER SUMMARY

This chapter provided an extensive overview of women's involvement in the global mining industry, focusing on Australia, Brazil, Canada, the UK, Ghana, Rwanda, Zimbabwe and South Africa. It highlighted historical barriers, legislative reforms and ongoing efforts towards gender equality and empowerment in each country's mining industry. Despite progress, challenges, such as discrimination, safety concerns, limited career advancement opportunities and unequal access to resources, persist across all regions.

In Australia, legislative reforms and initiatives such as WIMWA have advanced gender diversity in the sector. However, challenges remain regarding work–life balance and cultural biases. Brazil has seen recent legislative changes and initiatives such as WIM Brazil working towards greater gender equality, yet significant barriers to entry persist. Canada's mining industry has made strides in women's representation, but cultural biases and work–life balance issues persist. The UK has undergone significant transformations, with initiatives such as WIM UK advocating for women's rights and participation in the industry.

In Ghana, women constitute a significant portion of the artisanal and small-scale mining workforce, but face challenges such as limited access to education and health risks. Rwanda has made notable efforts to promote gender equality in mining; however, challenges such as educational barriers remain. Zimbabwe has a significant number of women in small-scale mining, but faces obstacles such as acquiring mining claims and workplace violence.

From the historical context of exclusion to the legislative reforms that gradually opened doors in South Africa, the journey towards gender equality and empowerment has been arduous and transformative. Despite significant strides, challenges persist, ranging from entrenched gender biases to safety hazards and limited career progression opportunities. Amid these challenges, initiatives such as WIMSA stand as beacons of hope, offering support, guidance and platforms

for women to thrive in the industry. While progress has been made, concerted efforts and ongoing initiatives are essential to ensure a more inclusive and equitable mining industry.

The chapter emphasised the multifaceted nature of the factors affecting the working conditions of women in the mining industry, rooted in (1) gender and cultural stereotypes and biases, (2) work–life balance, (3) workplace culture, (4) recruitment and selection, (5) job segregation, (6) disparities in access to essential benefits, (7) wage disparities, (8) career development, (9) structural factors and (10) health and safety. Addressing these challenges requires comprehensive strategies aimed at promoting gender diversity, ensuring equitable working conditions and fostering inclusive workplaces in the mining industry. The next chapter discusses statutory and regulatory frameworks pertaining to women employed in the South African mining industry.

CHAPTER FOUR

THE STATUTORY AND REGULATORY FRAMEWORKS PERTAINING TO WOMEN EMPLOYED IN THE SOUTH AFRICAN MINING INDUSTRY

4.1 INTRODUCTION

The previous chapter examined the literature on the employment of women in the mining industry, examining both global and national trends, and provided a discussion of the factors affecting the working conditions of women in the mining industry. This chapter presents and discusses the statutory and regulatory frameworks that govern the South African mining industry's labour workforce, including women, which speaks to Objective 3 of this study, which was to analyse the statutory frameworks (legislation and policies) applying to women working in the South African mining industry.

Legislation is a crucial tool of government for organising and protecting a country's citizens. However, without adequate implementation, legislation has little or no value (De Jager, 2000:3). Adequate and effective legislation is essential to ensuring women's full integration into the labour market and to ensuring equal rights and opportunities without discriminating against them (Mashaba, 2022:119). As a result, legislation and policies play an essential role in resolving gender imbalances at work (Gupta *et al.*, 2019:4).

In South Africa, the apartheid system dominated the political and legal systems between 1948 and 1990. By underwriting and enforcing a philosophy of separate racial development, the regime followed an approach of racial segregation. After an extended period of international political pressure and economic sanctions against South Africa's policies, the government of the day agreed to negotiate a new democratic constitution in the late 1980s. After being released from prison in 1990, Nelson Mandela was elected South Africa's first democratic president in May 1994. South Africa's transition to democracy paved the way for the abolition of past inequitable laws and policies that discriminated against women in the mining industry. Fundamental legislative changes were made to eradicate past disparities and promote gender equality. The South African Constitution was amended to eliminate prior discriminatory practices, and laws fostering inequality were repealed, as well as revisions made to labour laws to promote gender parity in the South African workforce. In addition, tailored legislation pertaining to the mining industry was introduced.

This chapter discusses the legislation framework that governs South Africa's labour force in general, and in particular the mining industry's labour force, with specific reference to women.

First, the South African Constitution of 1996; second, the Acts, policies and good practices that govern labour relations in the country; and third, the legislation and policies governing the mining industry.

4.2 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA (1996)

On 10 December 1996, former President Nelson Mandela signed the Constitution of the Republic of South Africa into law in Sharpeville, Gauteng. It was a commemorative gesture to remember those who had died during a peaceful demonstration against vicious pass laws on 21 March 1960 (DoJ&CD, 2022). A new Constitution was adopted on 4 February 1997, changing the country's legal, political, economic and social landscape (Botha, 2013:5; DoJ&CD, 2022). The South African Constitution is described as a 'transformative document'. Therefore, our Constitution aims to improve South Africa instead of maintaining the status quo (McConnachie *et al*., 2017:14). The Constitution is based on the notion that any law or behaviour violating the Constitution is unconstitutional (Thabo & Odeku, 2021:547). As a result, sector-specific legislation, such as the Labour Relations Act (LRA), is legitimate under the Constitution, especially Section 23. This section stipulates that employees have the right to fair labour practices, to establish and join trade unions, and to engage in union activities and strikes. Similarly, employers are free to organise and join their organisations and participate in their operations.

The preamble of the Constitution of the Republic of South Africa (RSA, 1996a:1243) encapsulates the foundational principles that underpin the nation's transformative journey from its tumultuous past to a democratic and inclusive future. It articulates a commitment to democratic values, social justice and fundamental human rights, emphasising the need to mend historical divisions. The preamble envisions a society where all citizens enjoy a high quality of life and have the opportunity to unlock their full potential, reflecting a dedication to inclusivity and equal opportunity (RSA, 1996a:1). Furthermore, it underscores the importance of a legal framework ensuring equal protection for every citizen and establishing democratic and open societies rooted in the people's will (Orgad, 2010:718). As expressed in the preamble, the ultimate aspiration is to build a united and democratic South Africa, poised to assume its rightful place among nations as a sovereign state, embodying the principles of justice, equality and collective will (Sauter, 2015:196). The Bill of Rights is presented in Chapter 2 of the Constitution. The following sections are relevant to this study: sections 9 (equality), 10 (human dignity), 11 (life), 12 (freedom and security of the person), 13 (slavery,

servitude and forced labour), 14 (privacy) and 23 (labour relations). The Constitution guarantees women a right to dignity, just as it does for all employees (RSA, 1996a:6).

Chapter 2 of the Constitution of the Republic of South Africa encompasses the cornerstone of individual rights and freedoms: the Bill of Rights. As delineated in the Constitution (RSA, 1996a:7–18; Van Heerden, 2021:152), this crucial chapter articulates democratic principles, with a central tenet being the unequivocal call for equality. Section 9(2) of the Bill of Rights (RSA, 1996a:7–8) meticulously defines the dimensions of equality, emphasising several vital principles. It establishes the foundational principle that all individuals are equal before the law and are entitled to equal protection and benefits. Furthermore, it affirms that every person is equally endowed with all rights and freedoms, allowing for legislation and measures to rectify and prevent unfair discrimination (Smith, 2014:615). As per this Section, the state prohibits direct and indirect discrimination across a broad spectrum, including race, gender and marital status (Van der Linde, 2020:4). To highlight the commitment to eradicating unfair discrimination, the provision mandates the implementation of national legislation (Bilchitz *et al*., 2016:13). In essence, Section 9(2) reinforces the constitutional imperative that equality is not just an aspirational ideal, but a legally enforceable principle designed to protect the rights and dignity of all individuals in the nation.

Section 10(2) of the Bill of Rights (RSA 1996a:7–8), on human dignity, contends that the dignity of every individual must be respected and protected. In addition, Section 11(2), on the right to life, maintains that life is a fundamental right for everyone (RSA, 1996a:6). Section 12(2) of the Bill of Rights relates to the freedom and security of the person. This Section contends that every individual has the right to freedom and security and that it is everyone's right to be physically and psychologically healthy (RSA, 1996a:4–6). Section 13(2) states that slavery, servitude and forced labour are all prohibited. Section 14(2) maintains that the right to privacy belongs to everyone (RSA, 1996a:6–7).

Section 23(2) of the Constitution of the Republic of South Africa (RSA, 1996a:9) is dedicated to labour relations and articulates fundamental principles shaping the interactions between employees, employers and trade unions. This Section robustly safeguards fair labour practices, ensuring that every individual is guaranteed equitable treatment in the workplace (Conradie, 2016:164). It explicitly recognises the rights of employees to join trade unions, participate in their activities and engage in strikes as a collective expression of their interests (Conradie, 2016:164; RSA, 1996a:9). Simultaneously, employers are accorded the right to form and join organisations representing their interests (Van Eck & Newaj, 2020:334). The provision underscores the autonomy of trade unions and employers' organisations in determining their administration, activities and programmes and the freedom to establish and

join federations (Budeli, 2010:16). Crucially, Section 23(2) enshrines the right to collective bargaining for trade unions, employers and their organisations, while allowing national legislation to regulate collective bargaining (Budeli, 2010:16–17; RSA, 1996a:9). Furthermore, it acknowledges the possibility of provisions in collective agreements related to union security, with the caveat that national legislation must enforce such provisions and comply with constitutional limitations, as outlined in Section 36(1) (Khumalo, 2018:328–329). This constitutional provision strives to create a balanced and just framework for labour relations, fostering cooperation and negotiation between employees and employers within the bounds of constitutional principles.

Gender equality is a constitutional right that ensures that women have the same status as men and prohibits discrimination against them. By enforcing the Constitution, women can participate in all spheres of life and enjoy equal rights as men, and it prevents gender-based bias from resulting in injustice. Even so, despite the Constitution's promotion of equality and prohibition of discrimination, gender inequality still exists in the mining industry. Even though the Constitution was enacted in 1997, there is still overt discrimination against women in mining, as discussed in Chapter Three. Furthermore, the industry lags in achieving its constitutional obligations. Trade and occupational freedom implies that women can occupy the same jobs as men; however, occupational bias still exists in the industry. As indicated in Chapter Three, failure to address these gaps can cause disengagement among employees and may result in women leaving the industry.

The following section discusses the labour laws governing employment relations, as well as those in the mining industry.

4.3 LABOUR LEGISLATION

The South African economy was primarily agrarian before the discovery of gold and diamonds. Employers and domestic employees were governed by various Acts, including the Master and Servants Act 15 of 1856 (Bhoola, 2002). As a result of the discovery of gold and diamonds, mining activity increased, and the first South African trade union was formed in 1881 (Bhoola, 2002; Mabaso & Mitonga-Monga, 2022). With the development of the mining industry, the difference in political power between white and black people became entrenched as unions mobilised increasingly in a racialised manner (Mabaso & Mitonga-Monga, 2022:47). As a result, the Mines and Works Act 12 of 1911 explicitly banned the employment of women in any mine (Mangaroo-Pillay & Botha, 2020; Union of South Africa, 1911). Several strikes were held to secure the positions of white employees in the mines. South African labour history was shaped by the 1922 strike, which led to the passage of the Industrial Conciliation Act in 1924

(Mhlophe, 2013:17). The Act provided recognition to trade unions that represented white employees and created a separate system for black employees (Union of South African, 1911). The Wiehahn Commission was established in 1979 due to the upsurge in strike action beginning in Durban in 1973 and the Soweto Uprisings of 1976. The Commission recommended the modification of the LRA to permit the formation of 'black' trade unions (Lester, 2023:181). Consequently, the 1956 Industrial Conciliation Act was amended to ensure that black employees were subjected to more stringent controls; this Act was repealed in November 1996 (Moncho, 2020:25).

Between 1991 and 1994, a new democratic South Africa emerged, and the Interim Constitution, Act 200 of 1993, changed the constitutional basis of the legal system (Bhoola, 2002). It was in 1994 that the Department of Labour (DoL) appointed a Ministerial Legal Task Team to draft new labour legislation, heralding a new era in South African labour law (Vettori, 2006:6–7). The LRA 66 of 1995 is the foundation of current labour relations (Subramanien & Joseph, 2019:2). In this section, an overview of the following main employment law statutes of South Africa relevant to the study is provided: the LRA 66 of 1995, the Basic Conditions of Employment Act 75 of 1997 (BCEA), the EEA 55 of 1998 (EEA) and the Promotion of Equality and Prevention of Unfair Discrimination Act (PEPUDA) 4 of 2000. The related codes of good practice linked to the relevant Acts are elaborated on under the discussion of each Act.

4.3.1 Labour Relations Act 66 of 1995

The LRA 66 of 1995, which is the basis of the current labour law framework, was formed after protracted negotiations between the government, employers and employees in April 1994 (Subramanien & Joseph, 2019:2). The promulgation of the LRA was a significant milestone in labour relations for two paramount reasons. First, it granted bargaining power rights to almost all public servants previously excluded from previous labour law, and second, the LRA entrenched the protection of strike actions (Maree, 2011:7–37; Subramanien & Joseph, 2019:2).

The LRA seeks to achieve four primary purposes: to promote economic growth, instil justice in society, create harmony in a once turbulent labour market and inculcate democracy in the workplace (Benjamin *et al.*, 2010:73–91). To achieve the purposes of the LRA, Section 1 identifies four primary objectives: (1) to give effect and regulate the rights affirmed in Section 23 of the Constitution of the Republic of South Africa, 1996; (2) to fulfil the country's responsibilities towards the ILO; (3) to facilitate collective bargaining and industrial policy formulation among employers, employees, their unions and organisations; and (4) to promote

orderly collective bargaining, collective bargaining at the sectoral level, decision making by employees in the workplace and effective resolution of labour disputes (RSA, 1995).

The LRA has undergone several amendments in the years since it was promulgated. On 11 November 1996, the Labour Relations Amendment Act 42 of 1996 came into effect (Mzimba, 2018). The Act brought forward the following amendments: to limit the deduction of agency fees from wages of employees who are not members of a trade union, to regulate the extension of collective agreements, to empower the dispute resolution committee, to provide for a council to agree with the Commission for Conciliation, Mediation and Arbitration (CCMA), to refer disputes to arbitration, to adjust provisions relating to the Constitution of a workplace forum and to contract with an accredited agency to perform certain functions on the Commission's behalf (Mzimba, 2018:7–53).

The Labour Relations Amendment Act 127 of 1998 was implemented on 1 February 1999. The Act allows a negotiating council or statutory council to create a pension, provident or medical assistance scheme or fund, subject to conformity with the rules (Whitear-Nel, 1999:49). It also modifies the standards for extending any collective agreement reached in a negotiating council, allows for the continuance of a scheme or fund upon the council's dissolution and empowers the Minister of Labour to choose the head of the essential services committee. Finally, it empowers the CCMA to establish rules, practices and procedures in specific areas, delegate certain functions of that office to a commissioner and consolidate various conciliation proceedings involving the same parties involved in two or more separate disputes before the commissioner (Whitear-Nel, 1999:49–53).

In 2002, the LRA was amended again, resulting in the Labour Relations Amendment Act 12 of 2002, which came into effect on 24 June 2002 (Biggs, 2008:427). A crucial part of the Act deals with the enforcement of collective bargaining agreements, extending bargaining council functions and rationalising bargaining council registration and amalgamation within the public service (Clarke, 2007:22). Furthermore, the amendment makes provision for the extension of the Commission's powers to make rules concerning procedures, the Minister's making of regulations about representation at the Commission and the charging of fees by the Commission, the exclusion of bargaining council arbitrations from the application of the Arbitration Act of 1965, the concurrent appointment of Labour Court judges as High Court judges, the regulation of employees' right not to be subjected to unfair labour practices, the resolution of disputes concerning an occupational detriment following the Protected Disclosures Act of 2000, the clarification and revision of procedures for resolving disputes in respect of dismissals based on the employer's operational requirements and the Commission's expediting resolution of disputes (Biggs, 2008:427).

Further amendments were made to the LRA in 2012 (Labour Relations Amendment Bill of 2012) and 2014 (Labour Relations Amendment Act 6 of 2014). The amendments addressed the issue of labour broking, regulating contract work, the CCMA, strikes and lockouts, essential services, organisational rights and collective bargaining. Employees could now file grievances with negotiating councils at CCMA offices (Benjamin, 2013:14). The completed referral form is then electronically forwarded to the jurisdictional negotiating council (Benjamin, 2013:4). Furthermore, Mudimba (2017:31) states that everyone (subject to income-earning ability) has free access to the CCMA for labour issues that fall under its jurisdiction. Bargaining councils are subject to the norms and regulations of specific sectors even if they are industry-specific and normally accessible at no cost too (Mudimba, 2017:31). Therefore, as a sector that is typified by so much labour unrest in South Africa, the mining industry, mine employees and their representatives find comfort in the provisions of this Act (Mudimba, 2017:31).

The most recent Act is the Labour Relations Amendment Act 8 of 2018, which took effect on 1 January 2019 (Cliffe Dekker Hofmeyr, 2018). The Amendment Act aims to amend the LRA 66 of 1995 to, among other things, clarify what criteria the Minister must meet before extending a collective agreement, provide for funding agreements to be renewed and extended, provide for picketing by collective agreement or by determination by the Commission in terms of picketing regulations, allow for a classification of a minimum service that has been ratified or determined and include all votes that are secretly recorded by members as ballots (Cliffe Dekker Hofmeyr, 2018).

No specific provisions in the Act address women in the mining industry or gender-related issues. However, it is essential to note that South Africa has a comprehensive legal framework that aims to promote gender equality in the workplace and address issues regarding the gender equality of women (Du Plessis, 2016:656). The LRA deserves praise for recognising the importance of freedom of association, collective bargaining and strikes to employees, as well as access to improving their overall working conditions inclusive of company benefits, company policies, development opportunities, infrastructure facilities, physical proficiency abilities, health and safety considerations and workplace practices. Having the right to participate in trade unions can make a significant difference to the employment conditions of employees. Increasing gender equality at work might benefit women in particular (Hartlapp *et al*., 2021:1).

There is a strong union presence in the mining industry in South Africa and a solid commitment to transforming existing gender inequalities in the workplace (Benya, 2013). The presence of women on such platforms could serve as an advocacy tool, facilitating the expression of women's concerns and needs in collective bargaining, for example. Therefore, such platforms

give women the opportunity and power to negotiate their priority workplace actions (Dickens, 2000:197). As a result of collective bargaining, women can also develop a variety of agendas to advance their interests, improve their working conditions and accelerate transformation, which challenge the prevailing masculine ideologies and practices that underpin collective bargaining (Dickens, 2000:197). Providing women working in mining operations with the necessary and reasonable working conditions will help them remain in the industry (Roos, 2014:45). The following section discusses the BCEA 75 of 1997.

4.3.2 Basic Conditions of Employment Act 75 of 1997

The BCEA 75 of 1997 replaced the Wage Act of 1957 on 1 December 1998 in the commercial sector and on 1 May 2000, in the public sector (Botha, 2013:112; Mudimba, 2017:32). The purpose of the BCEA is to promote economic development and social justice through the implementation of fair labour practices that are stipulated in Section 23(1) of the Constitution of the Republic of South Africa (RSA, 1997:12). It does so by establishing and applying primary employment conditions and regulating fair employment rights. Furthermore, the Act (RSA, 1997:15–64) regulates the following aspects: working hours, leave, employment and remuneration, deductions, termination of employment, prohibitions of child and forced labour employment, variations in primary employment conditions and sectoral determinations.

Per Section 25 of the BCEA, pregnant employees are entitled to at least four months of uninterrupted maternity leave (RSA, 1997). As per Section 26(1) of the Act, an employer may not demand or allow a pregnant or breastfeeding employee to perform work that might endanger her health or that of her child. In addition, Section 26(2) mandates that if an employee is required to work at night, as defined in Section 17(1), or if her job poses a risk to her health or safety or the safety of her unborn child, or if both, the employer must provide her with suitable alternative employment on terms and conditions that are no less favourable than her regular terms and conditions of employment, during her pregnancy and for six months after the birth of her child (RSA, 1997; Heine, 2012:15).

A Code of Good Practice on protecting employees during pregnancy and after birth, discussed in section 4.3.2.2, provides employers and employees with guidelines on protecting women's health from possible hazards in their workplace during pregnancy, after childbirth and during breastfeeding (Prinsloo, 2015:17).

Section 27 of the BCEA regulates family responsibility leave (RSA, 1997). The BCEA states that a person who has worked in a company for over three months is entitled to paid three-day family responsibility leave (Prinsloo, 2015:26; RSA, 1997).

In addition, the BCEA regulates night work (RSA, 1997). Under Section 17(2)(b), an employer may only require an employee to work night shifts if agreed, if remunerated by an allowance and if transportation between the employee's residence and the workplace is available at the beginning and end of the shift. In addition, employers must ensure that night shift employees do not work more than the maximum number of hours per week and provide reasonable rest periods between shifts (RSA, 1997). Employers must also provide adequate protection from accidents for employees working night shifts (RSA, 1997).

On 24 June 2002, the Basic Conditions of Employment Amendment Act 11 of 2002 was published in Government Gazette No. 23539 (RSA, 2002a). According to Oliphant (2012), the proposed amendments focused on changing the Minister's power, sectoral determinations, child labour, enhancing the inspectorate's power and penalties.

In 2018, an Amendment Bill for the BCEA was introduced. Among the changes were replacing and incorporating definitions that govern daily wage payments for certain employees, repealing specific provisions regarding sectoral determinations and dissolving the Employment Conditions Commission. In addition, the CCMA was given a more comprehensive jurisdiction. Also included in the Bill were provisions for monitoring and enforcement by labour inspectors; the National Minimum Wage Act of 2018 was amended, as were the Unemployment Insurance Act of 2001 and the Unemployment Insurance Contributions Act of 2002 (RSA, 2018:2).

On 1 January 2020, sections 1 to 7 of the Labour Laws Amendment Act of 2018 were introduced to amend the BCEA to, among other things, provide parental leave. Employees are entitled to 10 days' parental leave after the birth of their children, upon legal adoption of their children or upon placement of their children with prospective adoptive parents by court order (RSA, 2018).

Mudimba (2017:32) states that the BCEA provisions are fundamentally conducive to women's inclusion in the mining industry if implemented appropriately. The responsibilities of female miners in the labour force are not limited to work duties in the mines, as they also have household duties that must fit into the timetable of their everyday existence (Mudimba, 2017:32).

It is commendable that the BCEA works to prevent workplace discrimination and ensure that employees' employment conditions are not exploited. The provisions of family responsibility and maternity leave, for example, ensure that women have additional days to accommodate the responsibilities of looking after their families. Although prescribed working hours are set

so that employees have adequate rest periods daily, it could be argued that this does not meet the needs of women working at mines who face work–life balance challenges. Working mothers might not adequately balance their family responsibilities with their specified working hours. As discussed in Chapter Three, work–life balance challenges affect women more than men. In addition, the chapter showed that family-friendly workplaces tend to appeal most to women. The introduction of 10 days' parental leave, on the other hand, is encouraging, as it will benefit both men and working women when their children are born or adopted.

Codes of good practice are linked to the BCEA, which reinforces and supports the Act. A code of good practice, sometimes referred to as 'soft law', is a guide that indicates that no obligations will be imposed due to its provisions. It constitutes policy or best practice, or what is expected of a person (DoL, 1998). The following section discusses the codes of good practice linked to the BCEA guiding employers and employees on crucial employment relations.

4.3.2.1 Code of Good Practice on the Arrangement of Working Time

The DoL established the Code of Good Practice on the Arrangement of Working Time in South Africa under Section 87(2) of the BCEA, following consultations with the National Economic Development and Labour Council (NEDLAC) in 1997 (DoL, 1998:1).

This Code of Good Practice was established to provide employers and employees with practical guidance on adhering to workplace regulations pertaining to working hours, health, safety and family responsibilities (DoL, 2014:1). Section 7 of the BCEA emphasises employers' obligation to regulate their employees' working time with due consideration for various factors, including adherence to the provisions of occupational health and safety laws. In addition, emphasis is placed on implementing fair and ethical employment practices. Notably, the Code also underscores the importance of considering employees' family responsibilities in regulating working hours, acknowledging the significance of balancing work commitments and familial duties (ILO, 1997:2). Integration of the Code and the BCEA provides a comprehensive framework that prioritises employee well-being, safety and recognition of their personal and family circumstances in the realm of working time regulations.

4.3.2.2 Code of Good Practice on the Protection of Employees during Pregnancy and after the Birth of a Child

The DoL issued a Code of Good Practice on the Protection of Employees during Pregnancy and after the Birth of a Child under Section 87(2) of the BCEA, following consultations with NEDLAC in 1997 (DoL, 1998:1).

Many women are still working while they are breastfeeding, during pregnancy and after giving birth. This Code provides guidelines for employers concerning protecting women's health from potentially hazardous work environments during pregnancy, after childbirth and while breastfeeding. Furthermore, this Code is meant to serve as a guide for all employers and employees about the application of Section 26(1) of the BCEA, which forbids employers from compelling or allowing pregnant or breastfeeding employees to undertake labour that might be dangerous to their own or their child's health (RSA, 1998b:1). The physical, chemical and biological risks to which employees may be exposed at work may have a varying impact on various workplaces based on the kind of business and industry in which they are involved (RSA, 1998a:1).

The following section discusses EEA No. 55 of 1998.

4.3.3 Employment Equity Act 55 of 1998

The EEA 55 of 1998 was adopted in October 1998 and considers the impact previous apartheid discriminatory laws and practices had on disadvantaged people (RSA, 1998b:2). The Act is therefore intended to promote equality, democracy and the elimination of unfair discrimination in the workplace. In order to alleviate discrimination effects, employment equity is implemented to achieve a diverse workforce with broadly representative individuals through the promotion of economic development and efficiency among employees, as well as to fulfil the obligations of the country as a member of the ILO (RSA, 1998b:2). To achieve workplace equity, the EEA aims to eliminate unfair discrimination and implement affirmative action measures to remedy past employment injustices and to ensure that employees are represented equally in all occupational levels by guaranteeing equal opportunities and fair treatment (RSA, 1998b:2).

Chapter 2 of the EEA prohibits unfairly discriminating against any employee on one or more grounds in any employment policy or practice, including race, gender, sexuality, pregnancy, marital status, family responsibility, ethnicity, social background, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture and birth (RSA, 1998b:14). According to this Act, harassment is also considered unfair discrimination and prohibited (RSA, 1998b:14).

Chapter 3 discusses affirmative action, defined as additional corrective measures to enable HDSAs to benefit from an equitable employment environment (RSA, 1998b:5–15). Van Heerden (2021:96) states that affirmative action is a proactive and remedial approach to bridge the gap between formal and substantive employment equality. Black people, women

and people living with disabilities are called ‘designated groups’ (RSA, 1998b:3). In an company, affirmative action measures ensure equal employment opportunities for adequately qualified members of designated groups (RSA, 1998b:19). To foster equal opportunity in the workplace and promote workplace diversity, employers are expected to develop and implement equity plans. To ensure adequate representation of individuals from designated groups, employers should establish numerical goals when underrepresentation has been identified (RSA, 1998b:22).

This Act was amended in 2006. Amendments included the following: the term ‘designated groups’ was expanded to include women, individuals with disabilities who are natural persons and black people (African, coloured and Indian). A senior manager or manager must oversee employment equity, and these responsibilities must be incorporated into their performance agreements. Lastly, employers must consult a workplace forum and inform employees about the content and application of the Act, employment equity and discrimination issues, and the procedure the employer uses to involve all stakeholders (Nel *et al*., cited by Botha, 2013:115).

In 2012, the Employment Equity Bill underwent significant amendments, as outlined in the legislation (RSA, 2012:3–4), and these changes bear particular relevance to the context of this study. One crucial modification was made to Section 6 of the principal Act, where the section regarding unfair discrimination in employment policies or practices was revised (RSA, 2012:3-4). The amendment expanded the grounds on which discrimination is prohibited, now explicitly encompassing race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language, birth or any other arbitrary ground (RSA, 2012:3–4). Notably, the revised legislation also addressed disputes related to sexual harassment, allowing employees to refer such matters to the CCMA for arbitration. Another critical amendment involved the redefinition of affirmative action measures, clarifying that these measures are intended to ensure equal employment opportunities and adequate representation for qualified individuals from designated groups across all occupational categories and levels within a designated employer’s workforce (RSA, 2012:3–4). Furthermore, the revised Section 1 of the EEA of 1998 broadened the definition of ‘designated categories’ to include black people, women and individuals with disabilities who are South African citizens by birth or descent, irrespective of whether they acquired citizenship before or after 27 April 1994 (RSA, 1998b:5–15, 2012:3–4). This modification addressed the historical injustices of apartheid policies that had excluded certain groups from citizenship, reflecting a commitment to rectify past inequalities.

On 1 August 2014, the Employment Equity Amendment Act 47 of 2013 came into effect (Mashaba, 2022:124). For the first time, the amended Act adopted legislation governing equal pay claims (Mashaba, 2022:124). Section (6) of the principal Act was amended by adding subsection (4), which includes the following (Palmer, 2023:36–43; RSA, 2013:4): a disparity in employment terms and conditions between employees of the same employer performing the same or substantially the same work or work of equal value that is directly or indirectly based on any one or more of the following grounds: race, gender, sex, pregnancy, marital status, family responsibility, ethnic or social origin, colour, sexual orientation, age, disability, religion, HIV status, conscience, belief, political opinion, culture, language and birth.

In 2014, the Minister issued the Employment Equity Regulations 2014 to assess whether jobs are of equal value; this was because there were no specific provisions regulating equal pay claims before the Employment Equity Amendment Act 47 of 2013 (Ebrahim, 2016:3). In June 2015, the Code of Good Practice on Equal Pay/Remuneration for Work of Equal Value, discussed in section 4.3.3.1, was published. The aim was to help businesses and employees follow the principle at work (RSA, 2015:9).

July 2020 marked the latest revision of the EEA. To ensure the equitable representation of qualified people from designated groups, the 2020 Employment Equity Bill identifies sectoral numerical targets. These sector targets are scheduled to be applied from the year 2024 and may differ between occupational levels, sub-sectors, regions or any other relevant factors. Before determining the objectives, the Minister will consult relevant stakeholders and the Employment Equity Commission on the proposed sector objectives and publish any proposals for public comment (Salt & Sebatana, 2023).

Government's commitment to attaining gender equality in the workplace is evident from its ongoing renewal and revision of employment equity laws and enforcement (Commission for Gender Equality, 2021). Employers are also required to guarantee that these plans are executed adequately in addition to creating employment equity plans (Commission for Gender Equality, 2021). The EEA is a critical piece of legislation for promoting workplace equity and fairness; this is significant in the mining industry, as women are still subjected to discrimination (Abrahamsson & Johansson, 2021:266; Botha, 2013:116; Heimann *et al.*, 2023:6–7; Moalusi & Jones, 2019:7). Employers are expected to design and implement equity plans to promote equitable opportunities through affirmative action, which is promising (Botha, 2013:116), as this will help to overcome the industry's unequal representation of women.

The following section discusses the codes of good practice related to the EEA guiding employers and employees on critical aspects of employment relations.

4.3.3.1 Code of Good Practice on Equal Pay/Remuneration for Work of Equal Value

The Code of Good Practice on Equal Pay/Remuneration for Work of Equal Value, issued by the Minister of Labour in June 2015 under the EEA of 1998, aims to guide employers and employees in ensuring fair pay practices and eliminating discrimination based on arbitrary grounds (Van Wyk & Feldman, 2023). It mandates that employers take steps to rectify the disparities in terms of conditions of employment, including pay, for employees performing similar activities (DoL, 2015:8). Three key issues are addressed in this context (Van Wyk & Feldman, 2023):

- Employers must determine whether the jobs being compared are the same, substantially similar or of equal value.
- Employers must determine whether discrepancies exist in the terms and conditions of employment, including pay, for employees in comparable jobs.
- Any differences in employment terms must be justified in a straightforward and rational way.

To evaluate job value for equal pay purposes, employers must undertake an objective assessment based on specific criteria (Van Wyk & Feldman, 2023):

- Responsibilities associated with the work
- Skills, qualifications and experience required
- Physical, mental and emotional effort demanded
- Working conditions, including the physical environment and time and location of work.

While these criteria are generally applicable across sectors, their weighting may vary based on specific job requirements and employer preferences (Van Wyk & Feldman, 2023).

The Code also acknowledges the prevalence of pay discrimination based on gender and suggests evaluating male- and female-dominated jobs to address the undervaluation of female-dominated roles (Van Wyk & Feldman, 2023). Even if no directly comparable male-dominated roles exist in a company, evidence of differential treatment in employment terms can support claims of unfair discrimination (DoL, 2015:8–14).

After job evaluation, pay packages should align with job value and the employer's remuneration philosophy, ensuring fairness at all stages. Differentiation in pay may be permissible if based on fair and rational grounds, such as seniority, qualifications, performance or skills shortages (DoL, 2015:8–14).

The Code outlines a systematic process for evaluating jobs and addressing pay disparities (Van Wyk & Feldman, 2023):

- Conducting an audit to identify inequalities based on various factors
- Identifying jobs subject to evaluation and ensuring up-to-date job profiles
- Using a fair and transparent job evaluation system
- Comparing jobs in the company, including those undervalued due to discriminatory grounds
- Selecting a method for comparing pay, such as average or median earnings
- Justifying differentiation in pay based on fair and rational grounds
- Addressing identified inequalities without reducing employees' pay
- Monitoring and reviewing the process annually to ensure ongoing compliance.

Overall, the Code provides practical guidance for implementing equal pay principles and promoting fairness and equality in the workplace. It emphasises the importance of objective evaluation and fair treatment to eliminate discrimination and ensure equitable pay practices for all employees covered by the EEA (DoL, 2015:8).

4.3.3.2 Code of Good Practice on the Prevention and Elimination of Harassment in the Workplace

Under the EEA of 1998, harassment of an employee is a form of unfair discrimination. It is prohibited on any one or combination of the grounds of unfair discrimination stated in the Act, including any arbitrary ground (Cliffe Dekker Hofmeyr, 2024:2). To further address this, the Code of Good Practice on the Prevention of Elimination of Harassment in the Workplace (the Harassment Code) was published on 18 March 2022, with the objective of eliminating all forms of workplace harassment, in both private and public sectors, and formal and informal economy (CCMA, 2022; Ramjettan, 2020).

The Code draws its foundation from conventions adopted by the ILO in conjunction with South African legislation, notably including (Ramjettan & Nkosi, 2020) the following:

- Section 9 of the Constitution, which entails the right to equality
- Section 5 of the EEA, which requires employers to take proactive measures to foster equal opportunities in the workplace by reducing unfair discrimination from employment policies and practices
- Section 6(1) of the EEA, which states that no individual may discriminate against an employee

- Section 6(3) of the EEA, which acknowledges harassment of an employee as a form of unfair discrimination
- Section 60 of the EEA, which highlights the liability of employers for infringements of the EEA.

The purpose of the Code is to establish a framework for the interpretation and implementation of the EEA regarding the elimination of violence and harassment in the workplace (RSA, 2022:6). The Code provides guidelines to employers and employees on preventing, eliminating and managing harassment in the workplace, which is recognised as unfair discrimination (CCMA, 2022). In addition, the Code provides information on human resource policies, procedures and practices related to harassment, as well as appropriate methods for dealing with harassment and preventing its recurrence (CCMA, 2022).

The Harassment Code applies to employees, employers, job seekers and applicants, volunteers and, essentially, everyone working, despite their contractual status. It also applies to events that occur at work and in the course of work, whether it be training, social events or work-related travelling (Cliffe Dekker Hofmeyr, 2024:4; Ramjettan & Nkosi, 2020; RSA, 2022:6–7).

According to Ramjettan and Nkosi (2020), the Code regards violence and harassment in the workplace as a form of unfair discrimination. Harassment is defined as unwanted conduct that impairs dignity and creates a hostile or intimidating workplace for one or more employees (RSA, 2022:9). Violence and harassment encompass physical, psychological, emotional and sexual abuse, as well as the use or threat of physical force or power against oneself, another person or a group, which can result in injury, death, psychological harm, maldevelopment or deprivation (Ramjettan & Nkosi, 2020; RSA, 2022:9). The Code recognises three broad classifications of violence (Ramjettan & Nkosi, 2020):

- Self-directed violence (violence against oneself)
- Interpersonal violence (violence against another person)
- Collective violence (group or community violence).

The Code identifies the main forms of violence and harassment (Ramjettan & Nkosi, 2020) as follows:

- Sexual violence and harassment
- Racial, ethnic and social origin violence and harassment
- Workplace bullying

- Violence and harassment on account of a protected disclosure.

Furthermore, the Code includes definitions of physical harassment, verbal bullying, psychological harassment, bullying, vertical and horizontal harassment, passive-aggressive or covert harassment, mobbing and online harassment. Physical harassment encompasses physical attacks, simulated or threatened violence, or gestures (RSA, 2022:12). Verbal bullying may include threats, shaming, hostile teasing, insults, constant negative judgement and criticism, or racist, sexist or LGBTQIA+ phobic language (RSA, 2022:12). Psychological harassment in the workplace may be associated with emotional abuse and involves behaviour that has serious psychological consequences for the complainant, such as verbal abuse, bullying and mobbing (RSA, 2022:12).

For the first time, the Code includes bullying as part of the main forms of violence and harassment and refers to bullying as where harassment involves the abuse of coercive power by an individual or group of individuals in the workplace (RSA, 2022:13). This goes hand in hand with intimidation, which is the deliberate behaviour that would cause a person of ordinary sensibilities to fear injury or harm (RSA, 2022:13). Workplace bullying may involve aggressive behaviour in which someone repeatedly causes another person to be injured or discomfort (RSA, 2022:13).

Vertical harassment occurs when an employer or manager uses formal power such as title, position or supervisory control or material leverage such as financial, informational, resource or legal status to intimidate, threaten, harass or harm an employee or to dominate and control the complainant (RSA, 2022:13). In contrast, horizontal harassment refers to harassment between employees of the same job or level (RSA, 2022:14).

Furthermore, derogatory gossip, cruel jokes about other people, sarcasm, patronising gestures, eye contact, facial expressions, mimicking to make fun of others, intentionally creating embarrassment and insecurity, invisible treatment, marginalisation, social exclusion, professional isolation, as well as purposefully undermining someone's dignity, well-being, happiness, success and career performance are examples of passive-aggressive or covert harassment (RSA, 2022:14). Mobbing is a form of harassment by a group of individuals targeted at one or more individuals (RSA, 2022:14). Online harassment is harassment that is carried out, aided or aggravated in part or entirely through the use of information and communications technology, including email, social media, smartphones and the internet (RSA, 2022:14). The term 'cyber-bullying' (RSA, 2022:14) is used to refer to online bullying.

Based on these definitions, the Code provides seven guidelines for employers to guide their internal strategies in preventing and eliminating violence and harassment at work (Ramjettan & Nkosi, 2020):

- Workplaces should be free from violence and harassment.
- The safety of working environments should be safeguarded without any risk to health (including physical and psychological health).
- Workplace cultures should be created where complainants (and other individuals) can report violence and harassment without fear of reprisal and with the assurance that complaints will not be trivialised or ignored.
- Individuals in the workplace must refrain from committing any actions of violence and harassment.
- Individuals at the workplace all have a responsibility to create an environment where violence and harassment are perceived as unacceptable.
- Employers, employees, employer, companies and trade unions should ensure that all individuals dealing with the employer (e.g. clients, suppliers and job applicants) are not subjected to violence and harassment.
- Appropriate measures should be taken when instances of violence and harassment occur in the workplace.

The above section demonstrates efforts to understand and combat all types of harassment, workplace bullying and violence in South Africa. The following section discusses PEPUDA 4 of 2000.

4.3.4 Promotion of Equality and Prevention of Unfair Discrimination Act 4 of 2000

On 2 February 2000, Parliament approved PEPUDA 4 of 2000, which went into effect on 1 September 2000. The objectives of the Act, as outlined in the legislation (RSA, 2000:6), embody a commitment to fostering equality, preventing discrimination and upholding human dignity in alignment with constitutional principles and international obligations. First, the Act aligns with Section 9 of the Constitution, which mandates the enactment of legislation promoting equal protection. Reflecting the constitutional values of non-racialism and non-sexism, the Act strives to eliminate unfair discrimination and protect human dignity by prohibiting the promotion of hatred based on race, ethnicity, gender or religion that incites harm (Kok, 2008:3; RSA, 2000:6). Beyond these constitutional imperatives, the Act aims to eradicate unfair discrimination, hate speech and harassment, providing clear procedures for identifying instances of unfair discrimination. Moreover, it emphasises the importance of public education and awareness campaigns to combat discrimination, harassment and hate speech

(RSA, 2000:6). The Act is designed to safeguard the rights of individuals who have been subjected to discrimination, harassment or hatred and seeks to uplift those who have been disadvantaged by unfair discrimination. Importantly, it aligns with South Africa's international law commitments, including the Convention to Eliminate All Forms of Racial Discrimination and the Convention against Discrimination against Women, by facilitating compliance with these obligations (Kok, 2008:3). The Act serves as a comprehensive legal framework to promote equality, protect individual rights and foster a society free from discrimination, harassment and hate speech (Kok, 2008:3).

The Act (RSA, 2000:8) explicitly safeguards women from gender-based discrimination in the workplace, addressing a range of issues aimed at promoting gender equality. It unequivocally condemns gender-based violence and any practices that compromise the dignity and equality of women, extending its protective scope to include the well-being of girls (RSA, 2000:8). The Act addresses discriminatory policies or behaviours that limit women's access to crucial resources, finances and land, recognising the importance of economic empowerment (Mudimba, 2017:41). It expressly prohibits pregnancy discrimination, ensuring that women are not unfairly treated due to their reproductive status (RSA, 2000:8). Moreover, the Act takes a comprehensive approach by addressing restrictions on women's access to health, education and social security benefits, acknowledging the interconnectedness of these factors in achieving gender equality (RSA, 2000:8). It mandates the provision of reasonable measures to meet the diverse needs of women, compelling entities to refrain from refusing access to services and contractual opportunities (RSA, 2000:8). Notably, the Act tackles systematic inequalities between men and women in opportunities, affirming its commitment to dismantling barriers that perpetuate gender-based discrimination in the workplace. In essence, the Act serves as a crucial legal instrument in safeguarding the rights and dignity of women, fostering an environment that promotes equality and combats discrimination (Mashaba, 2022:130).

Section 11 of PEPUDA prohibits harassment; however, this decree fails to provide precise details regarding the type of harassment prohibited (RSA, 2000:9).

Furthermore, Section 29 of the Act (RSA, 2000:24) plays a pivotal role in identifying and addressing unfair labour and employment practices. It explicitly prohibits discrimination against individuals belonging to prohibited groups concerning human resources, development, promotion and retention in the workforce (RSA, 2000:24). This provision emphasises the necessity of creating an inclusive and equitable work environment, ensuring that professional growth and advancement opportunities are accessible to all employees regardless of their background (RSA, 2000:24). In addition, the Act addresses the crucial issue of equal pay, mandating that the principle of pay equity be rigorously upheld. By prohibiting discrimination

that contributes to unbalanced income differentials, Section 29 strives to eliminate disparities in remuneration based on factors such as race, gender or other prohibited grounds (RSA, 2000:24). In doing so, the Act seeks to promote fairness and equality in the workplace, fostering an atmosphere where all employees are treated with dignity and have equal opportunities for career progression and just compensation (Mashaba, 2022:130).

4.3.5 Conclusion

From the section above, it is evident that several pieces of legislation support women in workplaces, including the mining industry. These legislations ensure women's representation in workplaces and address unfair labour practices and discrimination issues that adversely affect women's working conditions.

The Constitution of South Africa is the country's supreme law and provides the framework for its governance. It protects the human rights of all its citizens. Regarding labour practices, the Constitution of South Africa enshrines certain rights to workers and also protects them. The LRA promotes fair labour practices, protects the rights of both workers and employers and aims to bring about industrial peace and stability. The EEA advances the constitutional right to equality, democracy in action and the elimination of unfair discrimination in employment. By establishing and implementing primary employment conditions and regulating employees' rights regarding fair labour practices, the BCEA enforces the right to fair labour practices as expressed in Section 23(1) of the Constitution. PEPUDA supports the constitutional provision that states that racial, gender and disability-related discrimination, hate speech and harassment should be eradicated.

The following section discusses the legislative framework about South Africa's mining industry.

4.4 MINING LEGISLATION

In recent years, significant changes have been made to mining legislation. These changes include allowing women to work in the mining industry and improving their overall working conditions. The preceding section provided an overview of the labour legislation in South Africa governing workplace issues, including those on women. This section focuses on legislation in the mining industry, specifically regarding women employed. The following laws and policies affecting and promoting women's participation in mining are discussed: the MHSA 29 of 1996, the MPRDA 28 of 2002, the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry (The Mining Charter) (2004) and its amendments in 2010 and 2018.

4.4.1 The Mine Health and Safety Act 29 of 1996

Previously, South African mine employees were protected by the Mines and Works Act 12 of 1911 and its applicable regulations. Following the repeal of the Mines and Works Act 12 of 1911, the Mines and Works Act 27 of 1956 was approved and was followed by the Minerals Act 50 of 1991. It should be emphasised that the Minerals Act placed little attention on increasing the occupational health status of the workforce and instead focused primarily on safety problems in the mining industry (MHSC, 2022).

In June 1996, the Leon Commission critically examined the Minerals Act, uncovering numerous deficiencies in worker safety and occupational health (Shibambu, 2017:25). Subsequently, the MHSA 29 of 1996 was introduced to establish a comprehensive legislative framework that fosters a secure and healthy work environment in the mining industry (Mashaba, 2022:134). The recommendations by the Leon Commission and adopted by the MHSA included restructuring agencies responsible for policing, aiming to enhance regulatory enforcement (Shibambu, 2017:25). Specific regulations addressing the mitigation of rock bursts and falls were proposed to minimise hazards in mining operations (MHSC, 2022). The Act also emphasised the importance of safeguarding worker health by implementing occupational and medical surveillance programmes focusing on combatting tuberculosis. Recommendations were made to restructure health information systems and research institutes to reinforce the health infrastructure (RSA, 1996b). Furthermore, the Act underscored the significance of ensuring that all employees in the mining industry receive proper training and certification, thereby contributing to a more competent and safety-conscious workforce (RSA, 1996b). Overall, these recommendations and subsequent legislative actions aimed to rectify shortcomings in the existing regulatory framework, prioritising the well-being and safety of employees in the mining industry (RSA, 1996b).

To better manage health and safety in mining, the MHSA has transitioned from regulatory prescriptiveness to risk-based management to enable companies to manage health and safety (Mashaba, 2022:134). In addition, Ranchod (2001:22) contends that it ended restrictions on women's work in the underground mining industry.

The MHSA 29 of 1996 specifies health and safety requirements for anyone operating in the South African mining industry (RSA, 1996b). Its primary purpose is establishing monitoring and inspection systems and investigating situations that risk miners' health and safety (RSA, 1996b). The Act gives both the employer and the employee rights and responsibilities for maintaining a safe and secure mining workplace (RSA, 1996b).

Given women's health and safety concerns in underground mining, the Act's application, implementation and monitoring methods were scrutinised (RSA, 1996b). Sections 5 and 6 of the MHSA are most relevant to women in mining, as they state that (5) managers must ensure a mine environment that is safe and healthy without endangering the health of the employees and (6) in a reasonable amount of time, managers should keep those facilities and equipment in a usable, sanitary state and ensure that each employee has access to suitable health and safety facilities and equipment. Therefore, managers must ensure adequate PPE items in sufficient quantities to allow every employee to utilise the equipment (RSA, 1996b).

Because PPE, mining machinery, tools and equipment are not often made with women in mind, those who work in the mining industry are most at risk of health and safety issues (Mashaba, 2022:135). In this regard, adherence to MHSA laws is essential to enhancing the health and safety of women.

The following section discusses the Guideline for a Mandatory Code of Practice for the Selection and Provision of Personal Protective Equipment for Women in the South African Mining Industry.

4.4.1.1 Guideline for a Mandatory Code of Practice for the Selection and Provision of Personal Protective Equipment for Women in the South African Mining Industry

The DMRE issued the Guideline for a Mandatory Code of Practice for the Selection and Provision of Personal Protective Equipment for Women in the South African Mining Industry under Section 49(6), read together with sections 9(2) and 9(3) of the MHSA 29 of 1996 (DMRE, 2023:1). This code of practice aims to address the historical inadequacies in PPE that have disproportionately affected women in mining, who have frequently been required to utilise equipment designed primarily for male physiology, thereby compromising their safety and comfort. It establishes guidelines for appropriately fitting PPE that accounts for the physiological differences between men and women, ensuring that female workers are not disadvantaged by ill-fitting equipment that may increase the risk of injury. By emphasising the necessity for gender-sensitive PPE, this code directly influences the working conditions of women in the mining industry, contributing to a safer and more equitable work environment (DMRE, 2023). Consequently, it aligns with broader efforts to enhance occupational safety standards and promote gender equity in traditionally male-dominated industries, providing insights into the practical challenges and policy requirements highlighted in the study.

The MPRDA directly regulates the mining industry, including women. The Act is discussed in the next section.

4.4.2 The Mineral and Petroleum Resources Development Act 28 of 2002

The MPRDA 28 of 2022 was fully effected in May 2004 (Botha, 2013:122). Swart (2003:489–492) considers the MPRDA a watershed moment in South Africa's overall mining transition. By eradicating racial discrimination, the Act reinforces government's commitment to ensure that all South Africans have equal access to the country's mineral treasures (Cawood, 2004:58). As the constitutionally acknowledged custodian of the nation's mineral and petroleum resources, government is empowered under this Act to redress the effects of historical racial and gender discrimination (Cawood, 2004:56–58). It explains how HDSAs (such as women and communities affected by mining operations) would be included in the wealth distribution process of minerals (Cawood, 2004:56–58).

The MPRDA outlines a comprehensive set of objectives aimed at responsibly managing South Africa's mineral and petroleum resources (RSA, 2002b:18). These objectives are multifaceted, reflecting a commitment to internationally accepted principles and recognition of the state's sovereign right over these resources (RSA, 2002b:18). The Act seeks to embody the principle of the state's custodianship of the nation's mineral and petroleum resources, emphasising equitable access for all South Africans (Cliffe Dekker Hofmeyr, 2023). Furthermore, the MPRDA is designed to significantly broaden opportunities for HDSAs, including women, fostering inclusivity in the mineral and petroleum industries (Cliffe Dekker Hofmeyr, 2023). In tandem, the Act aims to stimulate economic growth, mineral and petroleum resource development and employment, contributing to all citizens' social and economic welfare (RSA, 2002b:18). Security of tenure is prioritised for prospecting, exploration, mining and production operations, ensuring stability and sustainability (Van Niekerk, 2015:387–389). The MPRDA aligns with the constitutional mandate outlined in Section 24 by promoting orderly and ecologically sustainable development, coupled with social and economic progress (RSA, 2002b:18). Moreover, the Act mandates that holders of mining and production rights actively contribute to the socioeconomic development of the regions where they operate, fostering a holistic and responsible approach to resource exploitation (RSA, 2002b:18).

According to the Guideline for the Submission of a Social and Labour Plan, as required in Regulation 46 of the MPRDA, mining companies in South Africa must submit a Social and Labour Plan before obtaining mining licenses. These initiatives seek to enhance employment and promote the social and economic well-being of all South Africans. while also encouraging economic growth and socioeconomic development (RSA, 2010b:4).

The MPRDA is responsible for implementing policies that allow women to integrate fully into the mining industry. The Broad-Based Socio-economic Empowerment Charter for the Mining and Minerals Sector (the Mining Charter) is one of the policies to assure long-term economic growth and the involvement of previously disadvantaged people in the industry, such as women. The Mining Charter is discussed below.

4.4.3 The Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry (2004)

The Mining Charter, signed on 11 October 2002 and officially published by the South African government on 13 August 2004, brought significant changes to the country's mining industry (Botha, 2013:129). The Mining Charter is a South African mining industry economic empowerment policy that consists of nine components: human resource development, employment equity, migrant labour, mine community development, housing and living conditions, procurement, ownership and joint venture, beneficiation, and reporting (RSA, 2004:5). It was established through the Broad-Based Black Economic Empowerment Act 53 of 2003. There was an agreement between the DME (now the DMRE) and other stakeholders in the mining industry, including the Chamber of Mines, the South African Mining Development Association and the National Union of Mineworkers, that the DME would meet after five years to review how the objectives of the Charter had been achieved and to determine whether any further steps needed to be taken to achieve the Charter's objectives. This meeting was due in 2009. Following these nine components, a scorecard was prepared, and stakeholders were expected to be evaluated against the scorecard criteria to arrive at a final score (RSA, 2004:5; Mashaba, 2022:137).

The primary goal of the MPRDA was to facilitate the economic inclusion of previously disadvantaged groups, such as women, in the mining industry by leveraging existing resources (RSA, 2004:6). To ensure that this transformation was taking place, the DME carried out a thorough impact assessment in 2009 to evaluate the achievement of the components mentioned above (DMR, 2009; RSA, 2018:5). The findings are discussed in the DMR's Mining Charter Impact Assessment Report (DMR, 2009). Only the components and the related findings of the DMR's Mining Charter Impact Assessment Report directly related to women in mining are discussed below.

i. Human resource development

According to the Mining Charter (RSA, 2004:10), the South African labour market fails to produce sufficient skills required in the mining industry, necessitating collaborative efforts

among stakeholders to bridge the gap. This includes working with the MQA on skills development strategies, partnering with educational authorities to offer scholarships in mining-related fields, increasing registered learnerships from 1 200 to 5 000 by March 2005 and providing ongoing skills training through the MQA to improve miners' post-employment income potential (RSA, 2004:10).

Furthermore, the government committed to providing training for HDSA companies, facilitating international exchange opportunities and offering mining business skills courses through the MQA in collaboration with various institutions (RSA, 2004:10). Companies also pledged to ensure employee literacy and numeracy by 2005 by creating career paths for HDSA employees and establishing mentoring systems for empowerment groups (RSA, 2004:10).

The findings revealed that a total of 17.1% was achieved in terms of functional literacy and career paths. An average of 11.4% of empowerment groups were mentored. Furthermore, there was a disparity between employment plans (in terms of career pathing and mentoring) submitted to the DMR and their actual implementation. The findings also indicated that career plans are more focused on the development of senior managers and mostly exclude lower-level workers. In addition, the findings demonstrated a lack of investment in core and critical skills development in the mining industry (DMR, 2009:4–6).

ii. Employment equity

A vital component of the Mining Charter is the implementation of employment equity to improve the demographic profile of the workforce in the sector and, by so doing, contribute to its transformation. As the Mining Charter (RSA, 2004:11) stipulated, mining companies must publish their employment equity plans and achievements, targeting employment equity, particularly in junior and senior management positions. They aimed to have 40% HDSA management participation by 2009. In addition, companies must focus overseas training programmes on HDSAs, identify and fast-track talent pools, increase inclusiveness and women's advancement with a target of 10% participation by 2009 and regularly set and publish their goals and accomplishments (RSA, 2004:11).

The findings showed that only 37% of mining companies have developed employment equity plans, and few have been published. Mining companies achieved an average of 26% of the targeted 40% participation in HDSAs at the management level, while 33% of HDSAs at the management level were employed. A few HDSAs were employed in key decision-making positions, mostly middle-management ones. The results also revealed that only 26% of mining companies had reached the target of 10% female participation in the industry. Less than 1%

of women held core management positions, which white women primarily held. The average percentage of female participation in the mining industry was 6%, with the majority of them working in supportive roles (DMR, 2009:6–9).

iii. Housing and living conditions

Before the rise of democracy, black mine employees lived in harsh conditions that led to crime, substance abuse and the spread of diseases such as HIV/AIDS. In 2004, the Mining Charter included provisions concerning human living conditions that would ease the work environment for mining employees (DMR, 2009:11–13). Stakeholders, in consultation with the Mine Health and Safety Council, the Department of Housing and organised labour, committed to improving mine employees' housing standards by upgrading hostels, converting them to family units and promoting home ownership options. Furthermore, they undertook measures to enhance mine employees' nutrition (RSA, 2004:12).

The findings showed that significant progress had been made in improving mine workers' housing and living conditions. Mining companies provided housing for 26% of their employees, and 29% improved existing standards. Although most mines have moved away from hostel systems, upgrades and conversions of existing hostels to family units have been relatively low (DMR, 2009:11–13). Despite a reduction in occupants per unit, the occupancy rate remained high. It was found that most hostels had unhygienic living conditions and inadequate facilities. Approximately 29% of companies offered nutritional benefits to employees or planned to do so (DMR, 2009:11–13).

Despite shortcomings, the Charter was helpful and valuable in guiding mining companies in complying with the MPRDA, particularly in promoting black economic empowerment when applying for new mineral rights or converting existing rights (RSA, 2004:6–7).

Based on the impact assessment findings, the Charter was amended, and the new Charter was issued on 13 September 2010 to simplify and accelerate the achievement of its goals to overcome the shortcomings. The modification also addressed sustainable development, intended to enhance the industry's sustainable transformation and expansion (RSA, 2018:5). The Amended Mining Charter 2010 is discussed below.

4.4.4 The amendment of the Broad-Based Socio-Economic Empowerment Charter for the South African Mining and Minerals Industry (2010)

The amendment to the Broad-based Socio-Economic Empowerment Charter for the South African Mining and Minerals Industry aims to reduce historical inequalities further. The

amendments aimed to “facilitate sustainable transformation, growth, and development of the mining industry” (RSA, 2010a:ii).

The 2010 Mining Charter outlined comprehensive objectives to foster inclusive and sustainable development in South Africa’s mining industry (RSA, 2010a:i–ii). Among these goals, the Charter sought to ensure equitable access to the nation’s mineral resources for all South Africans, promoting a fair distribution of opportunities and benefits (RSA, 2010a:i). The Charter aimed to enhance the capabilities and skill sets of HDSAs, empowering them for active participation in the sector and community development (RSA, 2010a:1). In addition, it prioritised access to employment for mining communities and major labour-sending areas, aiming to advance the social and economic welfare of the people in these regions (RSA, 2010a:1). The Charter also highlighted the importance of promoting the beneficiation of South Africa’s mineral commodities, aiming to add value to the nation’s raw materials (RSA, 2010a:1). Finally, the Charter emphasised the necessity of fostering the sustainable development and growth of the mining industry, ensuring that it contributes positively to the broader economic landscape over the long term (RSA, 2010a:1).

The 2010 Mining Charter consists of nine components: ownership, procurement and enterprise development, beneficiation, human resource development, employment equity, mine community development, housing and living conditions, sustainable development and growth of the mining industry, and reporting (monitoring and evaluation) (RSA, 2010a:1–6). The DMR conducted a thorough impact assessment in 2014 to evaluate the Mining Charter implemented a decade ago. The assessment revealed a mixed picture of progress and challenges in the industry. While compliance levels had shown improvement in certain areas, indicating a degree of commitment to the Charter’s goals, it was underscored that the mining industry still had considerable strides in transformation (RSA, 2018:5). Only the elements and the related findings of the DMR’s Mining Charter Impact Assessment Report directly related to women in mining are discussed below.

i) Human resource development

Human resource development is paramount to the mining industry to ensure social transformation and sustainable development in the workplace. In order to meet the scorecard requirements, the mining industry had to invest a percentage of its annual payroll (3% by March 2011, 3.5% by March 2012, 4% by March 2013, 4.5% by March 2014 and 5% by March 2015) in skills development. Research and development initiatives to develop solutions in exploration, mining, processing, technology efficiency (energy and water use in mining),

beneficiation, environmental conservation and rehabilitation should be supported in skills development activities (RSA, 2010a:3).

The findings revealed that the calculation of percentage payroll expenditure on training was as per target. The 2014 target specified that 5% of the total annual payroll (excluding mandatory skills development levies) should have been spent on human resource development. According to the submitted reported data, 35.5% of right holders (not weighted) attained this target (RSA, 2015:28).

ii) Employment equity

In pursuit of social cohesion, transformation and enhanced competitiveness in the mining industry, the Mining Charter had instituted specific targets for HDSAs, including women, in various levels of management. The Charter mandated a minimum of 40% HDSA demographic representation to drive inclusive participation and leadership (RSA, 2010a:3). The outlined targets for executive management (board) and senior management (Exco) levels specified a gradual progression, requiring 20% representation by March 2011, increasing incrementally to 25% by March 2012, 30% by March 2013, 35% by March 2014 and ultimately reaching 40% by March 2015. Middle-management levels were expected to achieve 30% representation by March 2011, 35% by March 2012 and 40% by March 2013 (RSA, 2010a:3). Junior management positions were required to have 40% HDSA representation by March 2011 (RSA, 2010a:3). Furthermore, the Charter set targets for core and critical skills, stipulating 15% representation by March 2011, escalating to 20% by March 2012, 30% by March 2013, 35% by March 2014 and reaching the 40% threshold by March 2015 (RSA, 2010a:3). These targets reflected a commitment to fostering diversity and inclusion throughout all echelons of the mining industry, ensuring that the benefits and opportunities in the sector are equitably distributed among historically disadvantaged groups (RSA, 2010a:3).

The findings revealed that HDSAs met the following employment equity targets: 54.1% of top management, 50.7% of senior management, 52.7% of middle management, 62.8% of junior management and 75.2% of core skills positions (RSA, 2015:27).

iii) Housing and living conditions

The Mining Charter (RSA, 2010a:4) emphasises the dignity and privacy of mine employees. It is, therefore, necessary for mining companies to improve the standard of living and housing for mine employees. The Mining Charter stipulated that by March 2015, all hostels had to have been converted into family units and occupied by one person per room. Complying with both requirements required the following (from the baseline in March 2011): 25% by March 2012,

50% by March 2013, 75% by March 2014 and 100% by March 2015. Home ownership options had to be offered to all mine employees by 2014 (not scored).

According to the findings, 55% of the mining rights holders achieved the goal of improving the living conditions of the mineworkers by reducing the occupancy rate to one person per room or converting hostels to family units (RSA, 2015:19–20). The provinces with the highest number of mining rights holders achieving this goal were Limpopo, the Free State and the Northern Cape at 100%, 92% and 80%, respectively (RSA, 2015:20). The provinces where the majority of mining rights holders did not meet the target included KwaZulu-Natal, Gauteng, and North West, where 100%, 85% and 62% of the mining rights holders were not able to meet the target, respectively (RSA, 2015:20). Western Cape and Mpumalanga were not included in the data analysis because the augmented data in this component indicated that there were no hostels located in these provinces (RSA, 2015:20).

As a result of the findings of the second assessment, government conducted a comprehensive review of the Mining Charter in 2015 to strengthen its effectiveness as a tool for transforming the mining industry meaningfully and on a broad scale. This culminated in the 2018 Mining Charter, which is discussed next.

4.4.5 The Broad-Based Socio-Economic Empowerment Charter for the Mining and Minerals Industry (2018)

On 7 September 2018, the DMR finalised and published the Broad-Based Socio-Economic Empowerment Charter for the Mining and Minerals Industry (Mining Charter, 2018) (RSA, 2018). The Charter aims to facilitate sustainable transformation, growth and development of the mining industry (RSA, 2018:11). The Charter's mission is "to give effect to Section 100 (2)(a) of the MPRDA, Section 9 of the Constitution and harmonise Government's transformation policies" (RSA, 2018:11). The new Charter is aimed at strengthening its effectiveness while considering the realities facing the industry (RSA, 2018:11). The 2018 Mining Charter comprises seven components, namely human resource development, employment equity, ownership, procurement and enterprise development, mine community development, principles for housing and living conditions standards, and mineral beneficiation (RSA, 2018:6–7). The requirements in terms of the components that affect women employed in mining operations working conditions are outlined below.

i. Human resource development

The mining industry relies on human resource development for social transformation and sustainable growth. The Mining Charter aims to create a skilled, trained and diverse workforce

that meets today's demands, increases productivity and improves employment prospects for previously disadvantaged individuals. Furthermore, it aims to develop entrepreneurial skills to enhance livelihoods and diversify local and regional economies through mining (RSA, 2018:23–24).

According to the regulatory framework outlined in RSA (2018:23–24), a right holder in the mining industry is obligated to invest 5% of the leviable amount, excluding the mandatory statutory skills levy, in essential skills development. To meet this requirement, the right holder must allocate 3.5% of the leviable amount to critical skills development activities for employees and non-employees, including community members (RSA, 2018:23). This investment aims to enhance the skills and capabilities of individuals associated with mining operations (RSA, 2018:23). In addition, 1.5% of the leviable amount is designated for developing solutions in critical areas such as exploration, mining, processing, technology efficiency (mainly energy and water use in mining), beneficiation and environmental conservation and rehabilitation (RSA, 2018:24). This portion of the investment is directed towards South African public academic institutions, science councils and research entities to facilitate research and innovation in the mining industry (RSA, 2018:24). Any research and development expenditure must qualify for the research and development tax incentive per the Income Tax Act, Section 11D (RSA, 2018:24). In order to ensure an inclusive approach, investments in skilling and research must be allocated proportionately to national or provincial demographics, emphasising a commitment to broad-based development and equal opportunity in the mining industry (RSA, 2018:24).

ii. Employment equity

The EEA aims to eliminate unfair discrimination and implement affirmative action measures in the workplace to promote equal opportunity and fair treatment. Workplace diversity and equitable representation are crucial for social cohesion, transformation and competitiveness in the mining industry (RSA, 2018:24–25).

The Mining Charter stipulates a minimum threshold for representing black persons in decision-making positions and core occupational categories in the mining industry, aligning with provincial or national demographics. At the board level, a minimum of 50% of individuals with voting rights must be proportionally represented, with an additional requirement of 20% being black women (RSA, 2018:25). Executive or top management positions must have a minimum of 50% black directors proportionally represented, with 15% being black women (RSA, 2018:25). In senior management roles, a minimum of 50% representation of black individuals is mandated, with 15% being black women (RSA, 2018:25). Middle management is expected

to have a minimum of 60% representation of black individuals, with 20% being black women (RSA, 2018:25). Junior management positions require a minimum of 70% representation of black individuals, including 25% black women (RSA, 2018:25). In addressing diversity and inclusion, employees with disabilities must constitute 1.5%, reflective of national or provincial demographics (RSA, 2018:25). Moreover, to diversify core and critical skills, right holders must ensure that at least 60% of these skills are possessed by black individuals, promoting inclusivity across all levels of the company and emphasising the significance of STEM skills in the mining industry (RSA, 2018:26). This comprehensive approach underscores a commitment to equitable representation and opportunities in the mining industry.

iii. Principles for housing and living conditions standards

Regarding housing and living conditions, human dignity and privacy are still hallmarks of the mining industry in terms of enhancing productivity and accelerating transformation. Furthermore, the Department of Human Settlements and organised labour must be consulted before the right holder submits an approved Housing and Living Conditions Plan (RSA, 2018:28–29).

According to the Mining Charter (RSA, 2018:25), the principles of housing conditions include providing decent, affordable housing, home ownership options, and socially, physically and economically integrated human settlements with secure tenure for mine employees. Living condition principles involve proper healthcare services, an affordable and sustainable health system and balanced nutrition (RSA, 2018:25). Mining right holders must submit a Housing and Living Conditions Plan, approved by the Department of Minerals Resources after consulting organised labour and the Department of Human Settlements (RSA, 2018:26). This plan should align with clear objectives and timelines for implementing these principles, maintaining single and family units and other employee-agreed arrangements (RSA, 2018:26).

There is a scorecard attached to the Charter with weights associated with employment equity (30%), procurement and enterprise development (40%) and human resource development (30%) (RSA, 2018:36). Failure to comply with the targets outlined in each element will result in immediate punishment, suspension or termination of operations (RSA, 2002a:34, 2018b:82). The Minister may, by notice in the Government Gazette, review the 2018 Mining Charter (RSA, 2018:35). The 2018 Mining Charter, implemented in September 2018, stipulates that it will be reviewed annually for the first five years after its implementation (Stevens & Louw, 2019). The first review occurred in 2019, with subsequent reviews occurring annually up to and including 2023. Therefore, the next scheduled review after this period of five years would be in 2024 (Stevens & Louw, 2019).

Table 4.1 illustrates the components of each previously enacted Mining Charter to the latest (2018) Charter and their differences and contributions towards improving women's participation and position in the mining industry.

Table 4. 1: An analogy of the 2004, 2010 and 2018 Mining charters

Charter elements	2004 Mining Charter	2010 Mining Charter	2018 Mining Charter
Objectives	• Promoting equal access to mineral resources for all South Africans • Extending meaningful opportunities for HDSAs, including women, to enter the mining and minerals industry and benefit from its exploitation • Enhancing HDSAs' abilities by leveraging their existing skills • Increasing HDSAs' ability to serve the community by expanding their skill set • Promoting employment and supporting the social and economic well-being of mining communities and labour-sending areas • Enhancing South Africa's mineral beneficiation	• Making mineral resources equitable for all South Africans • Expanding the employment opportunities for HDSAs, especially women, in the mining industry and benefiting from the exploitation of the country's minerals • Enhancing HDSAs' abilities and giving back to the community by utilising and expanding existing skills • Increasing employment and improving social and economic well-being in mining communities and major labour-sending regions • Promoting the beneficiation of South Africa's minerals • Enhancing the mining industry's sustainability and growth	• Affirming the internationally recognised principle of state sovereignty, which gives the nation the right to exercise its authority and to make laws within its borders, as well as enhance the lives of its citizens, including the wealth of its mineral resources • Deracialising ownership patterns in the mining industry to address past imbalances and injustices • Expanding the opportunities for HDSAs, including women, to enter the mining and minerals industry and to benefit from the nation's mineral wealth • Enhancing HDSAs' empowerment through the use and expansion of existing skills • Achieving industry competitiveness and productivity by increasing employment and diversifying employees • Achieving social cohesion by improving South African social and economic outcomes • Promoting sustainable growth and competitiveness in the mining industry • Leveraging procurement spends of the

Charter elements	2004 Mining Charter	2010 Mining Charter	2018 Mining Charter
			industry to promote the growth of local mining inputs • Promoting the beneficiation of South Africa's mineral resources
Human resource development	To empower HDSAs, all stakeholders (the MQA, government, unions and mining companies) should subscribe to the following: • Provide scholarships and learnerships to promote mining-related educational advancement through the MQA • Provide skills training opportunities to mining employees, including women, through the MQA to improve their income-earning capacity after mine closures • Pursue training opportunities for HDSA employees and exchange opportunities with mining companies outside the country • Provide an MQA-led training course for mining entrepreneurs in collaboration with academic institutions and non-governmental organisations • Provide literacy and numeracy opportunities to employees by 2005 in consultation with trade unions	In addition to supporting South African-based research and development projects aimed at developing mining, exploration, processing and other areas (excluding mandatory skills levy), invest a percentage of payroll into demographic-reflective essential skills development activities: • 3% for 2010 • 3.5% for 2011 • 4% for 2012 • 4.5% for 2013 • 4% for 2014	Mining rights holders must invest at least 5% of the leviable amount (exclusive of the statutory skills development levy) in developing essential skills. A minimum of 5% must be invested as follows: • Invest in essential skills development activities for STEM, as well as artisan, internship, learnership, apprentice, bursary, literacy and numeracy skills training programmes for employees and non-employees (community members); graduate training programmes; research and development of solutions for exploration, mining and processing; technology efficiency (using energy and water efficiently in mining); beneficiation; and environmental conservation. National or provincial demographics must be considered when investing in skills and research. • Directors and executives are not considered employees for human resource development.

Charter elements	2004 Mining Charter	2010 Mining Charter	2018 Mining Charter
	• Provide career paths to HDSA employees to allow them to progress to higher positions • Set up mentoring systems as a capacity-building strategy that allow empowered individuals to be mentored		
Employment equity	Publicise employment equity plans and achievements and subscribe to the following: • Identify and establish employment equity goals, particularly for senior and junior management positions • Describe plans for employment equity at the management level; stakeholders seek a 40% HDSA participation in management within five years • Target HDSAs in overseas placement and/or training programmes whenever possible • Fast-track a talent pool by providing high-quality operational exposure • Enhance the level of inclusion and advancement of women by setting a five-year baseline of 10% representation • Set and publish targets and achievements	For social cohesion, transformation and competitiveness in the mining industry, companies must ensure diversity in the workplace and equitable representation of HDSAs. To ensure the diversity and participation of HDSAs in all decision-making positions and core occupational categories in the mining industry, every mining company must: • have HDSA representation in at least 40% of the following demographics: ▪ executive management (board) level ▪ senior management (Exco) level ▪ core and critical skills ▪ middle management level ▪ junior management level; and • establish career path programmes for its existing talent pool to ensure high-level operational exposure.	To create a diverse workplace, mining rights holders must achieve a minimum number of HDSAs that reflect their provincial or national rights and ensure their participation in the mining industry demographics as follows: • Board: 50% are HDSAs, 20% must be women • Minimum of 50% of executive directors must be HDSAs and 20% must be women • Minimum of 60% of senior management must be HDSAs and 25% must be women • Minimum of 60% HDSAs, proportionally represented, including 25% women • Minimum of 70% of HDSAs, proportionally represented, of which 30% must be women • Minimum of 1.5% of employees with disabilities, reflecting national or

Charter elements	2004 Mining Charter	2010 Mining Charter	2018 Mining Charter
			provincial demographics • Core and critical skills: a mining right holder must ensure that at least 60% of HDSAs are represented in its core and critical skills by diversifying its existing pools (reflective of demographics); STEM skills must be represented across all organisational levels The development and implementation of a career progression plan (aligned with its Social Labour Plan) to address: • career development matrices (including minimum entry requirements and timeframes) of each discipline; • individual development plans for employees; • a talent pool to be rapidly tracked following needs; and • a comprehensive plan with targets, timeframes and steps to implement the plan.
Housing and living conditions	The 2004 Mining Charter aimed to improve living conditions, but mine employees faced harsh conditions. Mining companies provided housing for 26% of their employees, and 29% improved existing	The Mining Charter emphasised the dignity and privacy of mine employees, requiring companies to improve living and housing standards. By March 2015, hostels had to have been converted into family units, with a	The mining industry prioritises human dignity and privacy in housing and living conditions to enhance productivity and transformation. The Department of Human Settlements and organised labour must be consulted before

Charter elements	2004 Mining Charter	2010 Mining Charter	2018 Mining Charter
	standards. Despite the reduction in hostel systems, the occupancy rate remained high due to unhygienic living conditions and inadequate facilities. Approximately 29% of companies offered nutritional benefits to their employees.	target of 25% by 2012, 50% by 2013, 75% by 2014, and 100% by 2015. Homeownership options had to have been offered to all mine employees by 2014.	submitting an approved plan. Revising the Housing and Living Conditions Standard component to provide clear targets and timelines ensures timely implementation.

Sources: Cliffe Dekker Hofmeyr (2018), Mashaba (2022:139–142) and RSA (2004, 2010a, 2018)

The Mining Charter has been considered one of the most critical policies to increase women's representation in the mining industry (Commission for Gender Equality, 2021; Kaggwa, 2020; Mangaroo-Pillay & Botha, 2020). Despite its many amendments, the Charter's mandate has consistently empowered women and promoted their permeability in the sector.

Based on the analysis of the Charter components in the 2004, 2010 and 2018 Mining charters, it is evident that the 2018 version has notable gaps. A primary concern of the 2018 Mining Charter is the absence of explicit objectives relating to the promotion of employment, support for mining communities and enhancing mineral beneficiation (Mashaba, 2022:142).

The Mining Charter is a crucial initiative aimed at promoting women's representation and participation in the mining industry. Despite numerous amendments, its mandate remains unchanged. The Charter's objectives include ensuring employment diversity and equitable representation of HDSAs, including women. The collaboration between industry stakeholders, such as the MQA, government, mining companies and trade unions, and opportunities for education and skills development are essential for women to enter and gain employment in the industry. However, the Charter does not address the challenges women face in their workplaces. Although the Charter requires certain percentages of women in mining and various positions, women's representation remains low. This is due to the industry's male-dominated culture, which causes challenges. The low representation of women is not the only issue, as other challenges are also perpetuated.

4.4.6 Conclusion

It is clear from the above that the DMRE aims to transform the entire mining industry. Various mining laws and policy documents support substantial and meaningful participation of women in all sectors (key positions, management positions and beneficiaries). In addition, the Mining Charter and accompanying scorecard promote commitment by setting the framework, goals and timeline for influencing HDSAs' (including women's) entry into the extractive industries. Mining companies may lose their operating license if they do not comply with the requirements of the Mining Charter and the scorecard.

4.5 CHAPTER SUMMARY

In conclusion, this chapter presented and discussed the statutory and regulatory frameworks that governed the South African mining industry's labour workforce, including women, aligning with Objective 4 of this study, which was to analyse the statutory frameworks (legislation and policies) applicable to women working in the South African mining industry.

This chapter highlighted select pieces of legislation and policies that guide the transformation process of the South African mining industry and reflect the efforts of government to address gender imbalances in the mining industry. The measures these laws provide should hopefully lead to an egalitarian mining industry. It is observed that the selected legislations are unified by a common goal to redress socioeconomic inequalities and occupational demographic status based on gender and racial lines, among others.

The Constitution is the country's supreme law. As the supreme law, the Constitution created the basis for reviewing the statutory and regulative framework about women. A discussion of labour laws followed this.

Laws such as the LRA, BCEA, EEA and PEPUDA governing gender equity and preventing workplace discrimination were identified as critical legislation. Furthermore, the relevant codes of good practice related to the focus of the study was also discussed: the Code of Good Practice on the Arrangement of Working Time, the Code of Good Practice on Protection of Employees during Pregnancy and after Birth of a Child, the Code of Good Practice on Equal Pay/Remuneration for Work of Equal Value, and the Code of Good Practice on the Prevention and Elimination of Harassment in the Workplace. The examination of labour legislation reveals a strong framework for women in workplaces, including the mining industry. These laws ensure women's representation and address unfair labour practices and discrimination, enhancing women's employment opportunities across sectors.

Specific to the mining industry, the MHSA and the MPRDA are the principal laws regulating mines and their employees, which include women. The Mining Charter was established to address matters about transformation in mining to ensure sustainable economic growth and involvement of previously disadvantaged individuals such as women.

The following two chapters present the study's empirical results and analyses.

CHAPTER FIVE

EMPIRICAL RESULTS: SOCIO-DEMOGRAPHIC INFORMATION, DESCRIPTIVE STATISTICS, RELIABILITY AND VALIDITY OF THE VARIABLES USED

5.1 INTRODUCTION

This research study examined the working conditions of women employed in mining operations at a platinum mine in South Africa. The preceding chapters provided the theoretical background, a comprehensive overview of women in mining and a legislative framework for this study. Chapter Two presented a theoretical framework that analysed the existing approaches, perspectives and theories related to gender and organisational change. Chapter Three provided an overview of the global and national trends and perspectives relating to women workers in the mining industry. Chapter Four addressed the statutory frameworks (legislation and policies) applying to women in the South African mining industry.

The following two chapters present the study's empirical results, which address objectives 5 and 6 of this study. Objective 5 of the study was to determine the working conditions of women employed in mining operations at a platinum mine in South Africa and to analyse and document the results. Objective 6 of the study was to assess the relationships between selected socio-demographic variables and the working conditions of women employed in mining operations at a platinum mine in South Africa. This chapter presents an overview of the study's research methodology and how it was implemented and operationalised. It also presents and discusses the socio-demographic information of the respondents, the descriptive statistics, and the reliability and validity of the variables used in the study.

5.2 IMPLEMENTATION OF THE RESEARCH METHODOLOGY

The research methodology used in this study was discussed in Chapter One under section 1.6. The study adopted a quantitative research approach informed by an objectivist ontology, an empiricist epistemology and a positivist research paradigm. Therefore, the study used a deductive approach to investigate the working conditions of women employed in mining operations in South Africa. An exploratory research approach was employed to obtain insights and identify underlying patterns concerning the working conditions of women employed in mining operations at the platinum mine under investigation. A cross-sectional research survey design was used, which analyses data from the population at a single point in time. The research setting was limited to one platinum mine in South Africa; the mine was selected based on availability (convenient sampling). The study's target

population was comprised of women working in mining operations, underground and on the surface, at the mine. Convenience sampling was used to select the respondents. The research used a structured questionnaire (see Annexure A) to collect the data. The structured questionnaire contained both closed-ended and open-ended questions. The structured questionnaire comprised the following eight sections: socio-demographic information, company benefits, company policies, development opportunities, infrastructure facilities, physical proficiency abilities, health and safety considerations, and workplace practices. Three-point, four-point and five-point Likert-type scales were used to measure the respondents' perceptions regarding company benefits, company policies, development opportunities, infrastructure facilities, physical proficiency abilities, health and safety considerations, and workplace practices. In addition, open-ended questions were included at the end of each section for respondents to elaborate further. The biographical questions included the following variables: age, racial group, marital status, number of children, highest qualification, where one works at the mine, the requirement to work night shifts, how long one has been working in the mining environment, level of employment, primary role, and reason for selecting a career in mining.

Two hundred questionnaires were distributed to women working in mining operations at three shafts at the mining site under investigation. In total, 196 responses were received. The Statistical Consultation Services at North-West University processed the data and assisted with the analysis and interpretation of the data.

The following section discusses the data analysis methods and techniques and elaborates on how the results were reported and interpreted.

5.2.1 Descriptive statistics

The study used descriptive statistics to describe, show and summarise the data set's essential features, as Kothari suggested (2004:131). The statistics summarise various aspects of the data, providing details about the sample and the population from which it is drawn (Larson, 2006:76). Using it improves analysts' understanding of the data (Kothari, 2004:131).

The type of a variable determines the extent of descriptive statistics calculated and how they are displayed (Larson, 2006:76). The primary descriptive statistics used with discrete variables are frequency statistics; these include relative frequencies (proportions or percentages of the total number of observations), cumulative frequencies for subsequent categories of ordinal variables and absolute frequencies (raw counts) for each category of the discrete variable (Larson, 2006:76).

According to Kaliyadan and Kulkarni (2019:83), there are three main categories of descriptive statistics for continuous variables: location statistics (such as mean, median, mode and

quantiles), dispersion statistics (such as variance, standard deviation, range and interquartile range) and shape statistics (e.g. skewness and kurtosis). The mean is the sum of all values in elementary arithmetic (Kaliyadan & Kulkarni, 2019:84). The midway value among the ordered values, with half of the ordered values below and half above, is referred to as the median (Kaliyadan & Kulkarni, 2019:84). The third location statistics is the mode, which is the most common value or values in the data (Kaliyadan & Kulkarni, 2019:84). The mean, median and mode are called measures of central tendency; they provide information about the centre of a distribution of values (Bryman, 2012:339; Larson, 2006:77). According to Bryman (2012:338), dispersion statistics, as opposed to location statistics, offer information on the variability of the data on measures of central tendency. The range in statistics for a given data set is the difference between the maximum and minimum observed values, therefore the range(x) = maximum(x) - minimum(x) (Larson, 2006:77). Furthermore, Larson (2006:77) contends that the variance or the standard deviation is used to measure dispersion from the mean. To calculate the standard deviation, one determines the mean, subtracts it from every data point and then squares it. After dividing the sum of squares by the sample size minus 1, the square root is calculated (Allen, 2017:8). Data sets with a larger or smaller standard deviation usually have a greater or lesser variability (Frey, 2018:3). The descriptive statistics in the study were reported by mean and standard deviation.

5.2.2 Multivariate analysis

Factor analysis is a multivariate statistical process that allows the study of underlying dimensions that explain the interactions between multiple variables by simplifying a collection of complicated variables (Eiselen & Uys, 2018:101; Tavakol & Wetzel, 2020:245). Hooper (2012:1) contends that factor analysis can be exploratory or confirmatory, allowing the researcher to determine the underlying dimensions in a data set. Exploratory factor analysis, on the one hand, involves simplifying interrelated measures in an orderly manner and examining underlying factors without preconceived structures for a given set of variables, resulting in factors being identified based on their underlying structure (Suhr, 2006:1). Confirmatory factor analysis, on the other hand, determines the relationship between observed variables and latent constructs. The researcher uses the theory, empirical research or both to postulate the relationship pattern a priori (Suhr, 2006:1). The study used exploratory factor analysis to determine the underlying dimensions of the scales used ~~in the study~~.

The first step in exploratory factor analysis is to report the extraction technique. The study employed principal component analysis, ~~which is~~ the most widely used technique (Tabachnick & Fidell, 2013:637). In principal component analysis, the observed variables are combined

into uncorrelated linear combinations to extract the maximum variance for each component from the data set (Tabachnick & Fidell, 2013:640).

In order to improve science utility and interpretability, rotation is applied after extraction (Tabachnick & Fidell, 2013:642). Factor rotation simplifies and provides theoretically meaningful solutions by drawing axes close to variables in factor space (Field, 2009:642). Oblimin with Kaiser normalisation was used as the rotation method in this case.

Moreover, it is also imperative to ensure that the observed variables are sufficiently related to one another to support an exploratory factor analysis (Watkins, 2018:226). Bartlett's test of sphericity is used to ensure this. Bartlett's test of sphericity compares the correlation matrix with the identity matrix to determine whether the data is spherical (Bartlett, 1951:337–344), in other words to determine whether the correlation matrix differs significantly from the identity matrix (Bartlett, 1951:337–344). In essence, it is a method that identifies whether any variables are redundant and can be summarised with certain factors if they are analysed together (Shrestha, 2021:6). In essence, Bartlett's test measures factorability by analysing the correlation matrix statistically to determine whether there are 1s on the diagonal and 0s off the diagonal (Field, 2009:612). If Bartlett's test is not significant, then the correlation matrix may not prove suitable for factor analysis, as there is not enough covariance between the variables (Bartlett, 1951:337–344; Field, 2009:612; Shrestha, 2021:6). For Bartlett's test to be accurate, it must be supplemented by some measure of sampling adequacy due to its sensitivity to deviations from randomness even at the most minor level. Among the measures of sampling adequacy is Kaiser-Meyer-Olkin (KMO), which indicates how much variance is shared across variables rather than by particular pairs of variables. It ranges from 0.00 to 1.00. A KMO value greater than 0.70 is desirable, and a value less than 0.50 indicates that the correlation matrix cannot be factored (Kaiser, 1974:35; Shrestha, 2021:6). According to Kaiser (1974:35), "KMO values in the 0.90s are marvellous; in the 0.80s, meritorious; in the 0.70s, middling; in the 0.60s, mediocre; and below 0.50, unacceptable".

The factors are arranged in descending order according to how much variance they can explain. The variance determines significant factors explained using Kaiser's criteria, and scree plots determine the number of factors to retain (Chetty, 2015; Hooper, 2012:13; Yong & Pearce, 2013:85). As per Kaiser's criteria, all factors with eigenvalues greater than 1 should be retained for interpretation (Hooper, 2012:13; Yong & Pearce, 2013:89–90). In SPSS, this is also the default method for retaining factors. Afterwards, factors are interpreted and named. There are no set rules in naming factors, except to name them according to the variables within them (Yong & Pearce, 2013).

Cronbach's alpha coefficient (simply called Cronbach's alpha) (Cronbach, 1951:297), also known as rho-equivalent reliability or the coefficient of alpha, was used to determine the internal consistency and reliability of the questionnaire items. According to Bryman (2012:169), reliability refers to the consistency of a concept's measure. Stability, internal reliability and interobserver consistency are three essential characteristics to examine when determining whether a measure is dependable (Bryman, 2012:169). Cronbach's alpha is an internal reliability test. It effectively averages all conceivable split-half dependability coefficients. A calculated alpha coefficient will range between 1 (perfect internal reliability) and 0 (denoting no internal reliability) (Bryman, 2012:170). In general, Cronbach's alpha is interpreted as follows: 0 to 0.49 is unacceptable, 0.50 to 0.59 is poor, 0.60 to 0.69 is questionable, 0.70 to 0.79 is acceptable, 0.80 to 0.89 is good and 0.9 to 1 is excellent (Costa & Sarmento, 2019; Field, 2009:675). The study used Cronbach's alpha to determine the internal consistency and reliability of the various scales used in the study.

5.2.3 Inferential statistics

This study used the following inferential statistics to determine the relationship between the socio-demographic variables and the scale variables related to working conditions of women employed in mining operations: independent samples t-tests, ANOVA and Spearman's rank-order correlation coefficient.

According to Ross and Wilson (2017:13), independent samples t-tests compare the means of two independent groups. The requirements for an independent samples t-test are as follows (Christopher, 2017:11; Field, 2009:150):

- A continuous measure (dependent variable) must be chosen, whereas an independent variable, categorical and dichotomous, should be the basis for the mean calculation.
- The dependent variable should have a normal distribution if the sample size is small.
- Data from one group cannot depend on data from the other, so observations between the two groups must be independent.
- There should be equal variance in scores between groups. It is called the homogeneity of variance assumption, signifying that one group should not have a higher standard deviation than the other group. Variances that depart from this assumption are heterogeneous (heterogeneous variances).

The variance of each group was tested using Levene's test. Using Levene's test in this study, a p-value below 0.05 indicates that the variances of the two groups in the sample are significantly different and that the homogeneity assumption is not met (Field, 2009:150). The t-value is reported from the row marked "equal variances not assumed". If the t-test p-value

(sig. [2-tailed]) is larger than 0.05, the test is not significant, which indicates no significant differences between groups and that homogeneity is met (Andrade, 2019).

The ANOVA test compares the means of more than two independent groups (Field, 2009:349). According to Kim (2017:22), an ANOVA test analyses the difference between categorical and continuous variables with more than two groups. ANOVA determines whether group differences are responsible for the results (Blankenship, 2018:2). ANOVA tests must meet the following assumptions (Blankenship, 2018:2; Field, 2009:348–350):

- It is essential that independent variables be measured on a nominal scale and that their conditions differ qualitatively rather than quantitatively.
- The independent variable should be sampled from a population with equal variance to obtain homogeneity of variance.
- Depending on the sample size and measurement scale, dependent variables should be quantifiable and normally distributed.

The ANOVA generates an F-statistic for comparing groups (Field, 2009:349). In F-statistics, systematic differences in variability between groups are compared to variation within each group (Kao & Green, 2008:5). Each group's mean is compared to determine variability. A group's variability is the variation in scores within the group due to chance (Kao & Green, 2008:5). F-statistics with a ratio of 1 indicate that the variability from within-group differences is equal to the variability caused by differences between groups (Field, 2009:350). The F-statistic increases as the variability between groups increases compared to the variability within groups. F-statistics with higher values indicate a coincidental difference between groups (Kao & Green, 2008:5). Each F-statistic has a p-value indicating statistical significance (Seltman, 2018:188). Statistical significance is declared when the p-value is less than 0.05, indicating that the variances between the groups are significantly different. P-values above 0.05 suggest that the test is not significant and that variances between groups in the population are not significantly different (Field, 2009:353).

In addition to the p-value, effect sizes were considered. Effect size can be used to assess the importance of the findings, indicating the relative magnitude of the difference between two group means (Pallant, 2016:212; Sullivan, 2012:283). This study used Cohen's d-value as effect size. Cohen (1988:82) suggests that a d-value of 0.2 indicates a small effect size, 0.5 a medium effect size and 0.8 a large effect size.

Correlation tests can help establish relationships (Taylor, 1990:36). Different correlation statistics exist, including Pearson product-moment correlations (Pearson's r), Spearman's rank-order correlations (Spearman's rho), Kendall's tau (T), point biserial and biserial

correlations (phi) and tetrachoric correlations (Statistics Solutions, 2023). Spearman's correlation coefficient was used to determine whether ordinal variables (age, race, marital status, children, highest qualification, place of work, working nightshift, duration of employment in the mining environment, level of employment, primary role, and primary reason for selecting a career in mining) influenced the working conditions of women in mining. Spearman's correlation coefficient measures how well two variables relate without relying on the assumptions of a parametric test (Field, 2009:749). The following section presents and discusses the socio-demographic information of the respondents who completed the structured questionnaire.

5.3 SOCIO-DEMOGRAPHIC INFORMATION

The sample's socio-demographic information covers the following: age, racial group, marital status, whether they have children, highest qualification, where they work in the mine (underground/surface), work night shifts or not, how long they have worked in the mining environment, their level of employment, their primary role, and their primary reason for selecting a career in mining. The information is presented in the form of tables.

In total, 196 women working in mining operations of the mine under investigation completed the questionnaire, although some did not complete all sections. Because most questionnaires were self-completed, the reasons for the incompleteness could not be determined. Due to the self-administered nature of most questionnaires, the specific reasons for incomplete responses could not be ascertained. However, incomplete questionnaires were not discarded outright; instead, the researcher retained only the responses that were deemed complete and analytically valuable. To mitigate the impact of missing data, a systematic approach was employed wherein incomplete responses were reviewed for partial usability. Cases with substantial missing information that compromised the integrity of the dataset were excluded from specific analyses. Consequently, the sample sizes varied across different variables, reflecting the selective inclusion of responses based on their completeness and relevance to the study objectives. This approach ensured that data quality was maintained while maximising the available information for statistical analysis. Table 5.1 reflects the socio-demographic information of the respondents.

Table 5. 1: Socio-demographic information of the respondents

Respondents' socio-demographic information			
Item	**Category**	**N**	**%**
Age	19 and younger	1	0.5

Respondents' socio-demographic information			
Item	**Category**	**N**	**%**
	20–29	23	11.7
	30–39	84	42.9
	40–49	73	37.2
	50–59	15	7.7
Racial group	Black African	195	99.5
	Coloured	1	0.5
Marital status	Single and not in a relationship	43	21.9
	Unmarried and in a relationship	68	34.7
	Widowed	6	3.1
	Married/Remarried	73	37.2
	Divorced/Separated	6	3.1
Children	None	17	8.7
	One	56	28.6
	Two	70	35.7
	Three	41	20.9
	Four	9	4.6
	Five	2	1.0
	More than five	1	0.5
Highest qualification	Less than high (secondary) school	8	4.2
	Completed some high (secondary) school	47	24.7
	High (secondary) school graduate	100	52.6
	Completed some college education	15	7.9
	Undergone technical/vocational training	4	2.1
	College/University degree	15	7.9
	Postgraduate degree	1	0.5
Where do you work at the mine?	Underground	172	88.7
	On the surface	12	6.2

Respondents' socio-demographic information			
Item	**Category**	**N**	**%**
	Underground and on the surface	10	5.2
Are you required to work night shifts?	Yes	35	17.9
	No	161	82.1
How long have you been working in the mining environment?	0–6 months	15	7.7
	7–12 months	16	8.2
	1–2 years	14	7.1
	3–5 years	9	4.6
	6–10 years	17	8.7
	11–20 years	124	63.3
	More than 20 years	1	0.5
What is your level of employment at the mine?	Unskilled worker	27	14.1
	Semi-skilled worker	87	45.3
	Skilled worker	74	38.5
	Junior management	2	1.0
	Middle management	2	1.0
Give the primary reason why you selected a career in mining	Close to home	3	1.6
	Unemployment	95	51.9
	Difficult to get another job	46	25.1
	Job security	13	7.1
	Bursary	1	0.5
	Exciting work environment	7	3.8
	Challenging industry	7	3.8
	Ability to apply skills	7	3.8
	Opportunities for advancement	2	1.1
	Other	2	1.1
Are you part of any work committees in your organisation, for example a Women in Mining Forum, Transformation	Yes	36	18.4
	No	160	81.6

Respondents' socio-demographic information			
Item	**Category**	**N**	**%**
Committee, Gender Equity Committee, Health and Safety Committee, Skills Development Committee, etc.?			

The results of Table 5.1 are discussed below.

5.3.1 Age

The majority of respondents fell between the age group of 30–39 (42.9%; N = 84), followed by those in the 40–49 age group (37.2%; N = 73), the 20–29 age group (11.7%; N = 23) and the 50–59 age group (7.7%; N = 15). Younger respondents were underrepresented, with only one respondent reporting being 19 and younger (0.5%; N = 1).

5.3.2 Racial group

Almost all respondents belonged to the black African (99.5%; N = 195) racial group. Respondents from other racial groups were underrepresented, with only one respondent reporting that they belonged to the coloured racial group (0.5%; N = 1).

5.3.3 Marital status

The largest group of respondents reported being married or remarried (37.2%; N = 73), followed by the respondents who reported being unmarried and in a relationship (34.7%; N = 68), and being single and not currently in a relationship (21.9%; N = 43). Two groups of respondents were underrepresented, with only six respondents each (3.1%; N = 6) reporting being widowed and being divorced/separated.

5.3.4 Presence of children

An accumulated total of 91.3% (N = 179) of respondents indicated that they have children, with most of the respondents reporting that they have two children (35.7%; N = 70). In addition, 8.7% (N = 17) of respondents stated they had no children.

5.3.5 Highest qualification

Most respondents completed high school (52.6%; N = 100), followed by those who completed some high school education (24.7%; N = 47). A similar number of respondents completed some college education (7.9%; N = 15) and attained a college or university degree (7.9%;

N = 15). Furthermore, 4.2% (N = 8) of the respondents reported having an education below high school level. A small group of respondents indicated undergoing technical or vocational training (2.1%; N = 4). The smallest group of respondents reported having a postgraduate degree (0.5%; N = 1).

5.3.6 Place of work in the mine

Most respondents (88.7%; N = 172) reported that they worked exclusively underground, followed by a smaller group of respondents (6.2%; N = 12) who reported that they exclusively worked on the surface of the mine. Ten respondents (5.2%) indicated working underground and on the surface of the mine.

5.3.7 Night shifts

Most respondents (82.1%; N = 161) reported not working night shifts, whereas 17.9% (N = 35) reported that they do work night shifts.

5.3.8 Duration of employment in the mining environment

The majority of the respondents (63.3%; N = 124) have been working in the mining environment for 11 to 20 years, followed by those with 6 to 10 years of experience (8.7%; N = 17) and those with 7 to 12 months of experience (8.2%; N = 16). Fifteen respondents (7.7%) reported working in the mining environment for less than six months. A group of 14 respondents (7.1%) reported having one to two years of experience in the mining environment. Nine respondents (4.6%) indicated having three to five years of experience. Only one respondent (0.5%) had more than 20 years of experience in the mining environment.

5.3.9 Occupational level

The majority of the respondents (45.3%; N = 87) stated that they were semi-skilled workers (this is a category of jobs that do not require advanced education or specialised skills to perform), followed by respondents (38.5%; N = 74) who reported that they are skilled workers. Furthermore, 14.1% of the respondents (N = 27) identified themselves as unskilled workers. Respondents in junior management positions (1.0%; N = 2) and middle management (1.0%; N = 2) were underrepresented.

5.3.10 Primary role at the mine

Figure 5.1 shows the respondents' primary roles at the mine. Respondents worked in various primary roles (43 occupations), with miners (31 of 196 respondents) and equipment helpers (24 of 196 respondents) being the majority.

Figure 5.1: Respondents' primary role at the mine

5.3.11 Primary reason for selecting a career in mining

There are different reasons why the respondents selected a career in mining, as reflected in Table 5.1. The majority of the respondents (51.9%; N = 95) reported that unemployment was the primary reason for selecting a career in mining. This suggests that for a significant portion of the sample, employment opportunities in the mining industry served as a response to broader economic challenges. A substantial number of respondents (25.1%; N = 46) indicated that difficulty finding another job was the primary reason for choosing a career in mining. This could imply that the mining industry provided a more accessible job market for these individuals.

In addition, there were respondents (7.1%; N = 13) who indicated job security as the primary reason for pursuing a career in mining, highlighting the perceived stability in employment in the industry. Furthermore, 3.8% (N = 7) of the respondents considered the exciting work environment as the primary motivation for their career choice, and another group of respondents (3.8%; N = 7) pointed to the challenging nature of the industry as their primary reason for choosing a career in mining. Another set of respondents (3.8%; N = 7) cited the opportunity to apply their skills as the main reason for pursuing a career in mining. Three respondents (1.6%) cited proximity to their residence as the primary reason for choosing a career in mining. Two respondents (1.1%) chose opportunities for advancement in the mining industry as their primary motivation. Another two respondents (1.1%) provided reasons not covered by the listed options. One respondent (0.5%) reported receiving a bursary as the primary reason for entering the mining industry.

5.3.12 Association with forums or committees at the mine

Most respondents (81.6%; N = 160) indicated that they are not part of any work committees, and 36 respondents (18.4%) reported being part of work committees in their company.

The open-ended responses to the question further revealed that the respondents actively participate in the following work committees in the mining company: the Health and Safety Committee and the Women in Mining Forum. This indicates proactive involvement in health and safety initiatives and gender-specific concerns, demonstrating commitment to collaboration and workplace well-being.

5.4 COMPANY BENEFITS

Section B of the questionnaire aimed to determine whether the mining company makes provision for company benefits. A dichotomous scale consisting of ‘yes’ and ‘no’ response

categories was used to measure the provision of company benefits. Table 5.2 provides the descriptive statistics on respondents' knowledge of the presence of mining company benefits and an indication of which benefits the mine has provided to them.

Table 5. 2: Descriptive statistics of company benefits

Existence company benefits					
		Yes		No	
No.	**Item**	**N**	**%**	**N**	**%**
B1	Performance bonus	169	88	23	12
B2	Housing	176	92.6	14	7.4
B3	Medical aid	184	95.8	8	4.2
B4	Travelling/Transport allowance	23	12	169	88
B5	Cell phone allowance	4	2.1	189	97.9
B6	Shift allowance	33	17.4	157	82.6
B7	Remoteness leave	6	3.2	182	96.8
B8	Training opportunities	151	78.2	42	21.8
B9	Bursary/Scholarship	40	20.9	151	79.1
B10	Bursary/Scholarship for employees' dependants	30	15.8	160	84.2
B11	Study leave	150	78.9	40	21.1
B12	Maternity benefits	175	91.1	17	8.9
B13	Alternative employment for pregnant women	184	96.8	6	3.2
B14	Day shift work for women with babies	34	17.8	157	82.2
B15	Day childcare	7	3.6	185	96.4
B16	Pension plan	168	90.3	18	9.7
B17	Life insurance	146	76.0	46	24.0
B18	Dental care	163	87.2	24	12.8

Most respondents replied favourably that the mine provides the mentioned benefits (see Table 5.2). Positive responses were obtained for the following items: performance bonus (88%; N = 169), housing (92.6%; N = 176), medical aid (95.8%; N = 184), training opportunities (78.2%; N = 151), study leave (78.9%; N = 150), maternity benefits (91.1%; N = 175), alternative employment for pregnant women (96.8%; N = 184), pension plan (90.3%; N = 168), life

insurance (76.0%; N = 146), and dental care (87.2%; N = 163). The majority of the respondents responded with 'no' for the following items: travelling/transport allowance (88%; N = 169), cell phone allowance (97.9; N = 189), shift allowance (82.6%; N = 157), remoteness leave (96.8%; N = 182), bursary and scholarship (79.1%; N = 151), bursary/scholarship for employees' dependants (84.2%; N = 160), day shift for women with babies (82.2%; N = 157) and day childcare (96.4%; N = 185). These results may provide valuable insights for organisational leaders to assess the awareness of their benefit programmes and address areas for potential improvement.

The open-ended responses to the question revealed that the mining company also provides for a provident fund as part of the company's benefits package.

5.5 COMPANY POLICIES

Section C of the questionnaire measured whether gender-sensitive policies in the mining company exist and whether the respondents are fully aware of the policies provided by the company. Table 5.3 gives a summary thereof.

Table 5. 3: Descriptive statistics of company policies

Descriptive statistics of company policies							
		Yes		No		Don't know	
No.	**Item**	**N**	**%**	**N**	**%**	**N**	**%**
C1	Employment equity policy	196	100	0	0	0	0
C2	Skills development policy	178	90.8	2	1.0	16	8.2
C3	Maternity policy	192	98	0	0	4	2
C4	Sexual harassment policy	196	100	0	0	0	0
C5	Gender-based health and safety policy	182	93.3	0	0	13	6.7
C6	Leave policy (including categories of leave such as annual leave, family responsibility leave, study leave, special circumstances/emergency leave)	194	99.5	0	0	1	0.5

From Table 5.3, it is evident that the majority of the respondents reported that the mentioned gender-sensitive policies are in place at the mining company. All the respondents (100%; N = 196) indicated that they were aware that the mine has an employment equity policy and a sexual harassment policy. In addition, almost all respondents reported that the following policies were in place: skills development policy (90.8%; N = 178), maternity policy (98%; N =

192), gender-based health and safety policy (93.3%; N = 182) and leave policy (99.5%; N = 194). Consequently, it is evident that most of the respondents working in mining operations at the mine demonstrated awareness of its gender-sensitive policies.

5.6 DEVELOPMENT OPPORTUNITIES

Section D of the questionnaire measured the perceived development opportunities offered by the mining company and the study assistance schemes available to women employed in mining operations; the results are discussed below.

5.6.1 Descriptive statistics of development opportunities

To measure perceived development opportunities, a five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) rarely, (3) sometimes, (4) often and (5) almost always. The descriptive statistics are presented in Table 5.4.

Table 5. 4: Descriptive statistics of development opportunities

Descriptive statistics of development opportunities						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
D1.1	Provision is made for the career development of women (e.g. career paths, individual development plans, mentorship plans, financial resources).	196	1	5	3.44	1.029
D1.2	Supportive practices are in place to assist women with career development needs (e.g. career counselling, senior leadership, mentoring).	196	1	5	3.31	1.052
D1.3	Financial support is provided to women for career development (e.g. sponsorships, bursaries, loans, travel and accommodation costs to attend conferences).	195	1	5	2.85	1.211
D1.4	Specialised skills development training opportunities are provided to women (e.g. welding and boiler-making courses).	196	1	5	3.03	1.090
D1.5	Communication is provided about training opportunities to women.	196	1	5	3.03	1.055
D1.6	Flexibility is offered in terms of the time and location of training to make it accessible to women.	195	1	5	2.96	1.052
D1.7	The training programmes help to increase women's chances of	196	1	5	3.01	1.081

Descriptive statistics of development opportunities						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
	promotion (e.g. transferral from a lower-level job to a higher-level job).					
D1.8	Specialised on-the-job training is provided to enable women to move into more technical areas of work.	196	1	5	3.00	1.086
D1.9	Effective mentorship programmes for women are provided.	196	1	5	2.89	1.108
D1.10	Opportunities for women to network and advance their careers are offered (e.g. women in mining events, exposure to women in mining associations).	196	1	5	3.10	1.076
D1.11	Structured leadership development programmes to enable women to enter senior leadership positions are offered.	196	1	5	3.10	1.091

*Min. = minimum; *Max. = maximum; *SD = standard deviation

From Table 5.4 it is evident that the mean scores of the items ranged between 2.85 and 3.44. The highest mean scores were obtained for QD1: “Provision is made for the career development of women” (M = 3.44), and QD2: “Supportive practices are in place to assist women with career development needs” (M = 3.31). QD10: “Opportunities for women to network and advance their careers are offered” and QD11: “Structured leadership development programmes to enable women to enter senior leadership positions are offered” both had mean scores of 3.10. The lowest mean scores were obtained for QD3: “Financial support is provided to women for career development” (M = 2.85). Therefore, it is clear that the respondents agreed that the mine, to some extent (between rarely and sometimes), makes provision for the career development, especially mentorship programmes, of women working in mining operations and that the mining company has supportive practices in place to assist women with career development needs; however, there is significant room for improvement, in particular in providing financial support to women for career development (QD3) and effective mentorship programmes (QD9).

5.6.2 Reliability and validity of development opportunities

An exploratory factor analysis was conducted on the 11 items of Section D to determine the factor structure of the development opportunities construct. The results of the KMO and Bartlett’s test of sphericity are presented in Table 5.5.

Table 5. 5: KMO and Bartlett's test of sphericity: Development opportunities

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.953
Bartlett's test of sphericity	Approx. chi-square	3764.735
	*Df	55
	*Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

Prior to conducting the exploratory factor analysis, KMO and Bartlett's tests of sphericity were used to confirm that the sample size was adequate and that the correlation between statements was sufficient for exploratory factor analysis, as suggested by Field (2009:652). The KMO measured 0.953, which is higher than the recommended threshold of 0.7 suggested by Kaiser (1974). According to Kaiser (1974:35), KMO values in the 0.90s are excellent. The p-value for the Bartlett's test of sphericity was less than 0.05, suggesting statistical significance; this indicated that the correlation between statements was sufficient for exploratory factor analysis (Field, 2009:652).

The results of the total variance explained are reported in Table 5.6. The table indicates how much variation each factor explains (Eiselen & Uys, 2021:68). Principal component analysis was used to extract the factors that had to be retained. This extraction method was used throughout the study.

Table 5. 6: Total variance explained: Development opportunities

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	9.607	87.338	87.338	9.607	87.338	87.338

Extraction method: principal component analysis

Table 5.6 shows that only one factor was extracted by Kaiser's criteria that explains 87.338% of the total variance of development opportunities. The component matrix presented in Table 5.7 shows the factor loadings.

Table 5. 7: Component matrix: Development opportunities

Development opportunities		
Question	**Item**	**Factor 1**
		Development opportunities
d1n8	Specialised on-the-job training is provided to enable women to move into more technical areas of work.	0.959
d1n10	Opportunities for women to network and advance their careers are offered (e.g. women in mining events, exposure to women in mining associations).	0.956
d1n7	The training programmes help to increase women's chances of promotion (e.g. transferral from a lower-level job to a higher-level job).	0.953
d1n5	Communication is provided about training opportunities to women.	0.952
d1n9	Effective mentorship programmes for women are provided.	0.946
d1n11	Structured leadership development programmes to enable women to enter senior leadership positions are offered.	0.945
d1n4	Specialised skills development training opportunities are provided to women (e.g. welding and boiler-making courses).	0.938
d1n3	Financial support is provided to women for career development (e.g. sponsorships, bursaries, loans, travel and accommodation costs to attend conferences).	0.933
d1n6	Flexibility is offered in terms of the time and location of training to make it accessible to women.	0.932
d1n2	Supportive practices are in place to assist women with career development needs (e.g. career counselling, senior leadership, mentoring).	0.903
d1n1	Provision is made for the career development of women (e.g. career paths, individual development plans, mentorship plans, financial resources).	0.860
Cronbach's alpha		0.985
Factor mean		3.067
Factor standard deviation		1.014

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

It is evident from the component matrix (see Table. 5.7) that 11 items loaded on the development opportunities factor; the factor loadings ranged from 0.860 to 0.959. Factor

loadings greater than 0.30 are typically accepted (Field, 2009:631). The greater the factor loading, the more significant the variable's contribution to the factor (Yong & Pearce, 2013:80–81). The factor shows excellent reliability and internal consistency with a Cronbach's alpha coefficient of 0.985, well above the required 0.7 (see Field, 2009:675). The factor mean was 3.067 on a five-point Likert-type scale ranging between (1) not at all and (5) almost always, indicating that the majority of the respondents agreed that the mining company sometimes provides development opportunities such as on-the-job training, networking opportunities, specialised skills development training opportunities and financial support for career advancement for women employed in mining operations, thereby indicating much room for improvement.

5.6.3 Study assistance schemes for women employed in mining operations

Regarding study assistance schemes for women employed in mining operations, the respondents were asked to indicate which study assistance schemes the mining company offers. Table 5.8 gives a summary thereof.

Table 5. 8: Study assistance schemes

Study assistance schemes							
		Yes		No		Don't know	
Item	Category	N	%	N	%	N	%
D2.1	Bursaries	10	5.1	108	55.1	78	39.8
D2.2	Study loans	7	3.6	109	55.6	80	40.8
D2.3	Skills development funds	7	3.6	108	55.1	81	41.3
D2.4	Sponsored scholarships	8	4.1	107	54.9	80	41.0
D2.5	Sponsored mining courses	111	57.2	43	22.2	40	20.6
D2.6	Opportunities to obtain formal qualifications at institutions of higher education	8	4.1	106	54.9	79	40.9

From Table 5.8 it is evident that just more than half of the respondents reported that the mining company does provide sponsored mining courses (57.2%; N = 111); however, almost the same amount of the respondents indicated that the mining company does not offer the following study assistant schemes: study loans (55.6%; N = 109), skills development funds and bursaries (55.1%; N = 108), sponsored scholarships (54.9%; N = 107) and opportunities to obtain formal qualifications at institutions of higher education (54.9%; N = 107).

Therefore, it is evident that the majority of the respondents are aware of sponsored mining courses offered by the mine; however, most of the respondents indicated that they were not aware of the rest of the study assistance schemes as listed in Table 5.8.

5.7 INFRASTRUCTURE FACILITIES

Section E of the questionnaire aims to establish whether the mining company provides suitable infrastructural facilities such as toilet and changing facilities, accommodation, and transport and childcare facilities to women working in mining operations on surface and underground. Tables 5.9, 5.13, 5.16 and 5.17 detail the results thereof.

5.7.1 Descriptive statistics of infrastructure facilities provided by the mining company on the surface

Section E (1) of the questionnaire measured the provision of infrastructure facilities on the surface by the mining company. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate extent, (4) to a great extent and (5) don't know. The results of the descriptive statistics are displayed in Table 5.9.

Table 5. 9: Descriptive statistics of infrastructure facilities on the surface

Descriptive statistics of infrastructure facilities on the surface						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
E1.1	Adequate TOILET facilities to accommodate the number of women using them are provided.	196	1	4	3.22	0.707
E1.2	Adequate CHANGING facilities to accommodate the number of women using them are provided.	196	1	4	3.17	0.670
E1.3	Hygienic TOILET facilities for women are provided.	196	1	4	2.84	0.664
E1.4	Hygienic CHANGING facilities for women are provided.	194	1	4	2.82	0.652
E1.5	Showers are equipped with curtains or doors.	193	1	4	1.24	0.636
E1.6	Change rooms are provided with sufficient lockers to accommodate the number of women using them.	193	1	4	1.94	0.985
E1.7	Separate toilet facilities are provided for women and men.	196	1	4	3.06	0.755

No.	Item	N	*Min.	*Max.	Mean	*SD
E1.8	The TOILET facilities have adequate sanitary bins.	196	1	4	2.79	0.636
E1.9	The TOILET facilities have adequate hand-washing facilities (e.g. washbasin and hand wash detergent).	195	1	4	2.77	0.628
E1.10	The TOILET facilities are located within a reasonable distance from the working place.	196	1	4	2.77	0.621
E1.11	The TOILET facilities have adequate lighting facilities.	196	1	4	2.81	0.608
E1.12	The CHANGING facilities have adequate sanitary bins.	196	1	5	2.83	0.646
E1.13	The CHANGING facilities have adequate hand-washing facilities (e.g. washbasin and hand wash detergent).	196	1	4	2.82	0.622
E1.14	Adequate accommodation is provided for female miners (e.g. family units).	196	2	5	3.64	0.768
E1.15	Adequate transport services to and from the mine are provided.	196	1	5	3.69	0.708
E1.16	Decent childcare facilities to accommodate women with children are provided.	196	1	5	1.29	0.799
E1.17	Adequate breastfeeding facilities for women are provided.	196	1	5	1.29	0.797

*Min. = minimum; *Max. = maximum; *SD = standard deviation

The mean scores of the items ranged between 1.24 and 3.69. The highest mean scores were obtained for QE1.15: “Adequate transport services to and from the mine are provided” (M = 3.69), QE1.14: “Adequate accommodation is provided for female miners (e.g. family units)” (M = 3.64) and QE1.1: “Adequate toilet facilities to accommodate the number of women using them are provided” (M = 3.22). The lowest mean scores were obtained for QE1.5: “Showers are equipped with curtains or doors” (M = 1.24) as well as QE1.16: “Decent childcare facilities to accommodate women with children are provided” (M = 1.29) and QE1.17: “Adequate breastfeeding facilities for women are provided” (M = 1.29). The standard deviation for all items ranged between 0.608 and 0.985. From the mean scores, it is clear that, on average, the respondents agreed that the mine, between not at all and to a moderate extent, makes provision for infrastructure facilities on the surface, therefore there is room for improvement in all areas, in particular providing showers equipped with curtains or doors, decent childcare facilities to accommodate women with children and adequate breastfeeding facilities.

5.7.2 Reliability and validity of infrastructure facilities provided by the mining company on the surface

An exploratory factor analysis was conducted on the 17 items of Section E1 to determine the factor structure of the infrastructure facilities on the surface construct. The results of the KMO and Bartlett's test of sphericity are presented in Table 5.10.

Table 5. 10: KMO and Bartlett's test of sphericity: Infrastructure facilities on the surface

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.838
Bartlett's test of sphericity	Approx. chi-square	3678.687
	*Df	120
	*Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

The KMO measured 0.838, exceeding the recommended threshold of 0.7. Therefore, the sample is adequate for factor analysis, as suggested by Kaiser (1974). The p-value of Bartlett's test of sphericity was less than 0.05, indicating sufficient correlation between statements, as recommended by Field (2009:652). The results of the total variance explained are reported in Table 5.11.

Table 5. 11: Total variance explained: Infrastructure facilities on the surface

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings
	Total	% of variance	Total	Total	% of variance	Cumulative %	Total
1	8.248	51.551	51.551	8.248	51.551	51.551	8.248
2	2.645	16.533	68.084	2.645	16.533	68.084	2.648

From Table 5.11, it is evident that two factors were extracted by Kaiser's criteria that explain 51.551% and 16.533% of the total variance for infrastructure facilities on the surface, respectively. The pattern matrix presented in Table 5.12 shows the factor loadings.

Table 5. 12: Pattern matrix: Infrastructure facilities on the surface

Infrastructure facilities on the surface			
No.	Item	Factor 1 Workplace amenities for female miners	Factor 2 Childcare and breastfeeding facilities
e1n9	The TOILET facilities have adequate hand-washing facilities (e.g. washbasin and hand wash detergent).	0.928	
e1n8	The TOILET facilities have adequate sanitary bins.	0.902	
e1n10	The TOILET facilities are located within a reasonable distance from the working place.	0.888	
e1n11	The TOILET facilities have adequate lighting facilities.	0.882	
e1n13	The CHANGING facilities have adequate hand-washing facilities (e.g. washbasin and hand wash detergent).	0.880	
e1n12	The CHANGING facilities have adequate sanitary bins.	0.875	
e1n3	Hygienic TOILET facilities for women are provided.	0.801	
e1n4	Hygienic CHANGING facilities for women are provided.	0.756	
e1n1	Adequate TOILET facilities to accommodate the number of women using them are provided.	0.756	
e1n7	Separate toilet facilities are provided for women and men.	0.714	
e1n2	Adequate CHANGING facilities to accommodate the number of women using them are provided.	0.684	-0.319
e1n16	Decent childcare facilities to accommodate women with children are provided.		0.872
e1n17	Adequate breastfeeding facilities for women are provided		0.868
e1n15	Adequate transport services to and from the mine are provided.	0.477	-0.561
e1n14	Adequate accommodation is provided for female miners (e.g. family units).	0.521	-0.544
e1n6	Change rooms are provided with sufficient lockers to accommodate the number of women using them.	0.421	0.448
Cronbach's alpha		0.922	0.996
Factor mean		2.918	1.211
Factor standard deviation		0.510	0.595

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

According to the pattern matrix (see Table 5.12), all the items loaded above 0.4 on the two identified factors (Factor 1: Workplace amenities for female miners; Factor 2: Childcare and breastfeeding facilities).

Fourteen items loaded on Factor 1, Workplace amenities for female miners; the factor loadings ranged between 0.421 and 0.928. The factor had a Cronbach's alpha of 0.922, which shows good reliability and internal consistency, as it is above the required 0.7 (see Field, 2009:675). The mean of Factor 1 was 2.918, which indicates that, on average, the respondents agreed to a moderate extent that the infrastructure facilities provided on the surface, such as separate toilet facilities for men and women, hygienic toilets and changing facilities with adequate hand-washing facilities, sanitary bins, adequate lighting within a reasonable distance from the working place are adequate for women employed in mining operations. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate extent, (4) to a great extent and (5) don't know.

Two items loaded on Factor 2: Childcare and breastfeeding facilities; the factor loadings ranged between 0.868 and 0.872. The factor had a Cronbach's alpha of 0.996, which shows good reliability and internal consistency, as it is above the required 0.7 (see Field, 2009:675). The mean of Factor 2 was 1.211, indicating that the mining company did not provide childcare and breastfeeding facilities according to the respondents.

5.7.3 Descriptive statistics of ablution facilities provided by the mining company underground

Section E (2) of the questionnaire measured the provision of ablution facilities underground by the mining company. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate extent, (4) to a great extent and (5) don't know. The results of the descriptive statistics are displayed in Table 5.13.

Table 5. 13: Descriptive statistics of ablution facilities underground

Descriptive statistics of ablution facilities underground						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
E2.1	Separate toilet facilities are provided for women and men underground.	193	1	5	3.01	0.851
E2.2	Hygienic toilet facilities are provided underground.	193	21	5	2.37	0.740
E2.3	The toilet facilities underground have sanitary bins.	195	1	5	2.33	0.744

Descriptive statistics of ablution facilities underground						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
E2.4	The toilet facilities underground have hand-washing facilities (e.g. washbasin and hand wash detergent).	193	1	5	2.30	0.671
E2.5	Toilet facilities underground are regularly cleaned.	194	1	5	2.31	0.682
E2.6	The toilet facilities underground are located within a reasonable distance from the working place.	196	1	5	2.32	0.667
E2.7	The toilet facilities underground have adequate lighting facilities.	196	1	5	2.30	0.667
E2.8	The toilet facilities underground have a locking device for privacy.	194	1	5	2.31	0.651

*Min. = minimum; *Max. = maximum; *SD = standard deviation

From the descriptive statistics in Table 5.13, it is evident that the mean scores of the items ranged between 2.30 and 3.01. The highest mean scores were obtained for QE2.1: “Separate toilet facilities are provided for women and men underground” (M = 3.01), QE2.2: “Hygienic toilet facilities are provided underground” (M = 2.37) and QE2.3: “The toilet facilities underground have sanitary bins” (M = 2.33). The lowest mean scores were obtained for QE2.7: “The toilet facilities underground have adequate lighting facilities” (M = 2.30), QE2.4: “The toilet facilities underground have hand-washing facilities (e.g. washbasin and hand wash detergent)” (M = 2.30), QE2.5: “Toilet facilities underground are regularly cleaned: (M = 2.31) and QE2.8: “The toilet facilities underground have a locking device for privacy” (M = 2.31). Therefore, it is clear that the respondents, on average, agreed that the mine, to some extent, makes provision for infrastructure facilities underground. There is, however, much room for improvement in providing toilet facilities with adequate lighting facilities, with hand-washing facilities, with a locking device for privacy and that are regularly cleaned. The standard deviation of the items ranged between 0.651 and 0.851.

5.7.4 Reliability and validity of ablution facilities provided by the mining company underground

An exploratory factor analysis was conducted on the eight items of Section E2 to determine the factor structure of ablution facilities underground. The results of the KMO and Bartlett’s test of sphericity are presented in Table 5.14.

Table 5. 14: KMO and Bartlett's test of sphericity: Ablution facilities underground

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.800
Bartlett's test of sphericity	Approx. chi-square	2041.708
	*Df	28
	*Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

KMO and Bartlett's tests of sphericity were used to confirm that the sample size was appropriate for exploratory factor analysis. The KMO measured 0.800, exceeding the recommended threshold of 0.7. The p-value of Bartlett's test of sphericity was less than 0.05, indicating a sufficient correlation between statements. The results of the total variance explained are reported in Table 5.15.

Table 5. 15: Total variance explained: Ablution facilities underground

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	6.290	78.631	78.631	6.290	78.631	78.631

Extraction method: principal component analysis

From Table 5.15, it is evident that only one factor was extracted by Kaiser's criteria that explains 78.631% of the total variance of ablution facilities underground. The component matrix presented in Table 5.16 shows the factor loadings.

Table 5. 16: Component matrix: Ablution facilities underground

Ablution facilities underground		
Question	Item	Factor 1
		Ablution facilities underground
e2n5	Toilet facilities underground are regularly cleaned.	0.960
e2n8	The toilet facilities underground have a locking device for privacy.	0.953
e2n7	The toilet facilities underground have adequate lighting facilities.	0.934

Ablution facilities underground		
Question	Item	Factor 1 Ablution facilities underground
e2n6	The toilet facilities underground are located within a reasonable distance from the working place.	0.929
e2n4	The toilet facilities underground have hand-washing facilities (e.g. washbasin and hand wash detergent).	0.926
e2n2	Hygienic toilet facilities are provided underground.	0.898
e2n3	The toilet facilities underground have sanitary bins.	0.871
e2n1	Separate toilet facilities are provided for women and men underground.	0.551
Cronbach's alpha		0.951
Factor mean		2.363
Factor standard deviation		0.547

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

According to the component matrix (see Table. 5.16), eight items loaded on the infrastructure facilities underground factor; the factor loadings ranged from 0.551 to 0.960. The factor shows good reliability with a Cronbach's alpha coefficient of 0.951, which is well above the required 0.7, and shows high reliability and internal consistency. The factor mean was 2.363, indicating that, on average, the respondents agreed to some extent that the ablution facilities provided underground are adequate for women employed in mining operations. Therefore, the mine to some extent makes provision for separate toilet facilities for women and men that are hygienic and include locking devices, sanitary bins, hand-washing facilities, adequate lighting in the area and are within a reasonable distance of the worksite. There is, however, significant room for improvement. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate extent, (4) to a great extent and (5) don't know.

5.7.5 Housing facilities

In Section E (3) of the questionnaire, the respondents were asked various questions regarding the mining company's provision of housing facilities. A three-point Likert-type scale consisting of the following response categories was used: (1) yes, (2) no and (3) don't know. Table 5.17 gives a summary thereof.

Table 5. 17: Housing facilities

Housing facilities							
		Yes		No		Don't know	
Item	Category	N	%	N	%	N	%
E3.1	Family units	191	97.9	0	0	4	2.1
E3.2	Hostels for men	191	97.9	0	0	4	2.1
E3.3	Hostels for women	2	1.0	112	57.4	81	S41.5
E3.4	Home ownership options	189	96.9	0	0	6	3.1
E3.5	Living-out allowance	188	95.9	2	1.0	6	3.1

From Table 5.17, it is evident that the majority of the women reported positively on the following housing facilities provided: family units and hostels for men (97.9%; N = 191) respectively, home ownership options (96.9%; N = 189) and living-out allowance (95.9%; N = 188). Only 1.0% (N = 2) of the respondents reported that the mining company provides hostels for women. Therefore, it is evident that the mining company makes provision for various housing facilities for women employees.

5.7.6 Childcare facilities

In Section E (4), the respondents were asked various questions regarding the mining company's provision of childcare facilities. A three-point Likert-type scale consisting of the following response categories was used: (1) yes, (2) no and (3) don't know. Table 5.18 gives a summary thereof.

Table 5. 18: Childcare facilities

Childcare facilities							
		Yes		No		Don't know	
Item	Category	N	%	N	%	N	%
E4.1	On-site day childcare facilities	0	0	177	90.3	19	9.7
E4.2	On-site 24-hour childcare facilities	0	0	189	96.4	7	3.6
E4.3	Day childcare facilities elsewhere	0	0	189	96.4	7	3.6
E4.4	24-hour childcare facilities elsewhere	0	0	189	96.4	7	3.6

From Table 5.18, it is evident that the majority of the women (90.3%–96.4%; N = 177–189) reported that the mining company does not make provision for childcare facilities, on site or elsewhere.

5.8 PHYSICAL PROFICIENCY ABILITIES

Section F of the questionnaire is divided into five sub-sections and aims to measure the perceived physical proficiency abilities of the respondents; the results are discussed below.

5.8.1 Descriptive statistics of appointment practices for women employed in mining operations

In Section F (1), the focus was placed on the practices of appointing women in mining operations. A five-point Likert-type scale consisting of the following response categories was used: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree. The descriptive statistics are presented in Table 5.19.

Table 5. 19: Descriptive statistics of appointment practices

Descriptive statistics of appointment practices						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
F1.1	Women are only appointed in mining operations positions if they have the required physical and functional capabilities.	196	2	5	4.42	0.589
F1.2	Women are only appointed in positions that require physical strength and endurance if they are declared medically fit.	196	2	5	4.36	0.654
F1.3	Women's size and body build are considered when appointing them in core mining positions.	196	1	5	4.10	0.985
F1.4	Women are often appointed in positions without having the physical capability to cope with the requirements of the position.	194	1	5	2.07	0.723
F1.5	Male employees often have to assist women if they are unable to cope with the requirements of their positions.	196	2	5	3.76	0.703
F1.6	Male employees often become annoyed when they have to assist women when they lack physical strength.	196	1	5	3.71	0.746

*Min. = minimum; *Max. = maximum; *SD = standard deviation

Table 5.19 shows that the mean scores of the items ranged between 2.07 and 4.42. The highest mean scores were obtained for QF1.1: “Women are only appointed in mining operations positions if they have the required physical and functional capabilities” (M = 4.42), QF1.2: “Women are only appointed in positions that require physical strength and endurance if they are declared medically fit” (M = 4.36), QF1.3: “Women’s size and body build are considered when appointing them in core mining positions” (M = 4.10), QF1.5: “Male employees often have to assist women if they are unable to cope with the requirements of their positions” (M = 3.76) and QF1.6: “Male employees often become annoyed when they have to assist women when they lack physical strength” (M = 3.71). The lowest mean scores were obtained for QF1.4: “Women are often appointed in positions without having the physical capability to cope with the requirements of the position” (M = 2.07). Therefore, it is clear that the respondents agreed that the mine considers various physical proficiency abilities when appointing women in mining operations. The standard deviation of the items ranged between 0.589 and 0.985.

5.8.2 Reliability and validity of appointment practices

An exploratory factor analysis was conducted on the six items of Section F (1) to determine the factor structure of appointment practices. The results of the KMO and Bartlett’s test of sphericity are presented in Table 5.20.

Table 5. 20: KMO and Bartlett’s test of sphericity: Appointment practices

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.650
Bartlett's test of sphericity	Approx. chi-square	643.168
	Df	10
	Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

The KMO obtained a value of 0.650, which is acceptable according to Field (2009:651). The Bartlett’s test of sphericity had a p-value less than 0.05, indicating statistical significance. Therefore, the sample size was adequate and the correlation between statements was sufficient for exploratory factor analysis, as suggested by Field (2009:652). The results of the total variance explained are reported in Table 5.21.

Table 5. 21: Total variance explained: Appointment practices

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.991	59.818	59.818	2.991	59.818	59.818

Extraction method: principal component analysis

From Table 5.21 it is evident that only one factor was extracted by Kaiser's criteria that explain 59.818% of the total variance of appointment practices. The component matrix is presented in Table 5.22.

Table 5. 22: Component matrix: Appointment practices

Appointment practices		
Question	Item	Factor 1
		Appointment practices
f1n2	Women are only appointed in positions that require physical strength and endurance if they are declared medically fit.	0.945
f1n3	Women's size and body build are considered when appointing them to core mining positions.	0.891
f1n1	Women are only appointed in mining operations positions if they have the required physical and functional capabilities.	0.884
f1n5	Male employees often have to assist women if they are unable to cope with the requirements of their positions.	0.597
*f1n4	Women are often appointed in positions without having the physical capability to cope with the requirements of the position.	0.406
Cronbach's alpha		0.799
Factor mean		3.919
Factor standard deviation		0.550

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

*F1n4 was recoded (reversed) when reliability was calculated.

Only five of the six items loaded on the factor 'Appointment practices'. During the factor analysis process, item F1n6 was removed, because the item had no factor loading, and item F1n4 was reversed and recoded to have the same directional relationship with the underlying construct. According to the component matrix (see Table. 5.22), the factor loadings of the five items ranged between 0.406 and 0.945. The factor shows excellent reliability and internal consistency with a Cronbach's alpha coefficient of 0.799, which is above the required 0.7 (see Field, 2009:675). The factor mean was 3.919, indicating that, on average, the respondents agreed that the mine considers women's physical proficiency abilities such as medical fit tests, size and body build, and physical and functional capabilities when appointing them in mining positions. A five-point Likert-type scale consisting of the following response categories was used: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree.

5.8.3 Descriptive statistics of women's physical capability

Section F (2) focused on women's perceived physical capability. A five-point Likert-type scale consisting of the following response categories was used: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree. The descriptive statistics are presented in Table 5.23.

Table 5. 23: Descriptive statistics of women's physical capability

Descriptive statistics of women's physical capability						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
F2.1	Certain employment positions are not well suited for women.	196	1	5	3.86	1.454
F2.2	Some mining tasks can only be done by men.	193	1	5	2.72	1.657
F2.3	Women have the capability to operate a locomotive.	195	3	5	4.26	0.591
F2.4	Women have the capability to operate a winding engine.	196	2	5	4.25	0.635
F2.5	Women have the capability to operate a load haul dump machine.	196	3	5	4.24	0.617
F2.6	Women have the capability to operate a rubber dozer.	195	3	5	4.24	0.625
F2.7	Women have the capability to operate a conveyer belt.	195	3	5	4.27	0.595
F2.8	Women have the capability to operate heavy and/or vibrating power tools, e.g. a rock drill.	195	1	5	3.61	1.145

No.	Item	N	*Min.	*Max.	Mean	*SD
F2.9	Women have the capability to operate a winch.	196	3	5	4.27	0.610
F2.10	Women have the capability to operate a shift.	195	2	5	4.28	0.605
F2.11	Women experience more physiological strain than men when performing mining tasks.	196	2	5	4.71	0.538
F2.12	Women experience physiological strain when performing physically demanding tasks for an extended period.	196	2	5	4.67	0.622
F2.13	Labour-intensive work is tough on women's bodies (e.g. results in fatigue and body pain).	196	3	5	4.76	0.440
F2.14	Labour-intensive work results in menstrual cycle issues (e.g. delayed ovulation and longer cycles).	194	3	5	4.80	0.447
F2.15	The inclusion of women in a mining team has a negative impact on productivity.	195	1	4	2.14	0.732

*Min. = minimum; *Max. = maximum; *SD = standard deviation

From Table 5.23 it is evident that the mean scores of the items ranged between 2.14 and 4.80. The highest mean scores were obtained for QF2.1: "Labour-intensive work results in menstrual cycle issues (e.g. delayed ovulation and longer cycles) ("M = 4.80), QF2.13: "Labour-intensive work is tough on women's bodies (e.g. results in fatigue and body pain)" (M = 4.76) and QF2.11: "Women experience more physiological strain than men when performing mining tasks" (M = 4.71). The lowest mean scores were obtained for QF2.15: "The inclusion of women in a mining team has a negative impact on productivity" (M =2.14) and QF2.2: "Some mining tasks can only be done by men" (M = 2.72). Therefore, it is clear that, on average, the majority of the respondents agreed that women have the physical capability to be employed in mining operations; however, they also agreed that some work tasks may have negative consequences for women. The standard deviation of the items ranged between 0.440 and 1.657.

5.8.4 Reliability and validity of women's physical capability

The 15 items of Section F(2) were subjected to an exploratory factor analysis to determine the underlying dimensions of the physical capability construct. The results of the KMO and Bartlett's test of sphericity are presented in Table 5.24.

Table 5. 24: KMO and Bartlett's test of sphericity: Women's physical capability

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.741
Bartlett's test of sphericity	Approx. chi-square	3763.086
	*Df	91
	*Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

The KMO measured 0.741, which indicates that the sample size is adequate for factor analysis (see Kaiser, 1974). The p-value for the Bartlett's test of sphericity was less than 0.05, suggesting statistical significance; this indicated that the correlation between statements was sufficient for exploratory factor analysis (see Field, 2009:652). The results of the total variance are reported in Table 5.25.

Table 5. 25: Total variance explained: Women's physical capability

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings
	Total	% of variance	Total	Total	% of variance	Cumulative %	Total
1	7.404	52.889	52.889	7.404	52.889	52.889	7.399
2	2.943	21.020	73.909	2.943	21.020	73.909	2.944

Table 5.25 indicates that two factors explain most of the information in the 15 items; these factors explain 52.889% and 21.020% of the total variance, respectively. The pattern matrix shows the factor loadings (see Table 5.26).

Table 5. 26: Pattern matrix: Women's physical capability

Women's physical capability			
No.	Item	Factor 1	Factor 2
		Women's physical capacity	Women's physical challenges
f2n6	Women have the capability to operate a rubber dozer.	0.966	
f2n7	Women have the capability to operate a conveyer belt.	0.965	

Women's physical capability			
No.	Item	Factor 1 Women's physical capacity	Factor 2 Women's physical challenges
f2n3	Women have the capability to operate a locomotive.	0.961	
f2n9	Women have the capability to operate a winch.	0.961	
f2n4	Women have the capability to operate a winding engine.	0.956	
f2n5	Women have the capability to operate a load haul dump machine.	0.952	
f2n10	Women have the capability to operate a shift.	0.925	
f2n8	Women have the capability to operate heavy and/or vibrating power tools, e.g. a rock drill.	0.706	
f2n2	Some mining tasks can only be done by men.	-0.550	0.325
f2n13	Labour-intensive work is tough on women's bodies (e.g. results in fatigue and body pain).		0.912
f2n14	Labour-intensive work results in menstrual cycle issues (e.g. delayed ovulation and longer cycles).		0.813
f2n12	Women experience physiological strain when performing physically demanding tasks for an extended period.		0.763
f2n11	Women experience more physiological strain than men when performing mining tasks.		0.736
f2n1	Certain employment positions are not well suited for women.		0.428
Cronbach's alpha		0.958	0.609
Factor mean		4.177	4.255
Factor standard deviation		0.615	0.574

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

F2N15 was removed from factor analysis, as the item had no factor loading and the factor analysis was repeated.

During the factor analysis process, item F2n15 was removed, because the item had no factor loading. The pattern matrix (see Table. 5.26) shows that all 14 items had factor loadings above 0.3 on the two identified factors (Factor 1: Women's physical capacity and Factor 2: Women's physical challenges).These two factors differ in that the former emphasises women's ability to perform operational tasks such as operating heavy machinery and power tools, while the latter focuses on the physiological and health-related difficulties women encounter when engaging

in physically demanding tasks. These challenges include experiencing greater physiological strain compared to men, as well as the physical toll of labour-intensive work, which can lead to body fatigue and menstrual cycle disruptions.

Eight items loaded on Factor 1: Women's physical capacity; the factor loadings ranged between 0.706 and 0.966. The factor shows excellent reliability and internal consistency with a Cronbach's alpha coefficient of 0.958, which is well above the required 0.7 (see Field, 2009:675). The factor mean was 4.177, indicating that, on average, the majority of the respondents agreed that women have the physical capacity to operate heavy machinery and/or vibrating power tools. A five-point Likert-type scale consisting of the following response categories was used: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree.

Six items loaded on Factor 2: Women's physical challenges'; the factor loadings ranged between 0.325 and 0.912. The factor had a Cronbach's alpha of 0.609, which is below the required 0.7, but still acceptable according to Field (2009:675). Field (2009:668, 675) states that Cronbach's alpha could realistically be below 0.7 and that a small number of statements could result in a lower Cronbach's alpha. The factor mean was 4.255, indicating that, on average, the women agreed that some mining tasks can only be done by men and that they experience physiological strain and challenges when performing physically demanding tasks. A five-point Likert-type scale consisting of the following response categories was used: (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree.

5.8.5 Pre-employment medical examinations

Section F (3) of the questionnaire aimed to determine whether women had to undergo pre-employment medical examinations; the results are presented in Table 5.27.

Table 5. 27: Pre-employment medical examinations

Pre-employment medical examinations							
		Yes		No		Don't know	
Item	**Category**	**N**	**%**	**N**	**%**	**N**	**%**
F3.1	Written questionnaire about your medical history	195	100	0	0	0	0
F3.2	Standard physical assessments (e.g. testing hearing, lung function, eyes, blood pressure, joint range of motion)	195	100	0	0	0	0
F3.3	Physical fitness test (e.g. running on a treadmill, riding an exercise bike, performing a step-aerobics test)	194	99.5	1	0.5	0	0
F3.4	Heat tolerance screening	194	99.5	0	0	1	0.5

From Table 5.27, it is evident that the majority of the respondents reported positively on the following pre-employment medical examinations: written questionnaire (100%; N = 195), standard physical assessment (100%; N = 195), physical fitness test (100%; N = 194) and heat tolerance screening (100%; N = 194). Consequently, it is evident that most of the respondents working in mining operations at the mine agreed to have undergone the various pre-employment medical examinations such as completed a medical history questionnaire, physical assessment, as well as a heat tolerance test, and they are well aware of them.

5.8.6 Equipment and tools banned for women

Section F (4) of the questionnaire aimed to determine whether there are specific equipment and tools in the workplace that are banned for women; the results are presented in Table 5.28.

Table 5. 28: Equipment and tools banned for women

Equipment and tools banned for women							
		Yes		No		Unsure	
Item	**Category**	N	%	N	%	N	%
F4.1	Are there specific equipment and tools in the workplace that are banned for women at your mining organisation?	0	0	142	72.4	54	27.6

From Table 5.28 it is evident that 72.4% (N = 142) of the respondents indicated that no equipment and tools in the workplace are banned for women at the mining company. The

remaining 27.6% (N = 54) reported that they were unsure of whether or not there are specific equipment and tools in the workplace that are banned for women.

5.8.7 Work units banned for women

Section F (5) of the questionnaire aimed to determine whether there are specific work units in the workplace that are banned for women; the results are presented in Table 5.29.

Table 5. 29: Work units banned for women

Work units banned for women							
		Yes		No		Unsure	
Item	Category	N	%	N	%	N	%
F5.1	Are there work units at your mining organisation that is banned for women?	0	0	155	79.1	41	20.9

From Table 5.29 it is evident that 79.1% (N = 155) of the respondents reported that there are no work units banned for women at the mining company. The remaining 20.9% (N = 41) reported that they were unsure of whether or not there were work units banned for women.

5.9 HEALTH AND SAFETY CONSIDERATIONS

Section G of the questionnaire looked at the health and safety considerations for women employed in mining operations at the mining company; the results are discussed below.

5.9.1 Descriptive statistics of health and safety considerations

Section G (1) of the questionnaire measured women's health and safety considerations in the workplace. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) rarely, (3) sometimes, (4) often and (5) almost always. The descriptive statistics are presented in Table 5.30.

Table 5. 30: Descriptive statistics of health and safety considerations

Descriptive statistics of health and safety considerations						
No.	Item	N	*Min.	*Max.	Mean	*SD
G1.1	Women are supplied with information about the hazards and risks to their health and safety.	196	1	5	4.82	0.549
G1.2	Women are supplied with information about the measures taken to eliminate or minimise these hazards and risks.	196	1	5	4.82	0.539

No.	Item	N	*Min.	*Max.	Mean	*SD
G1.3	All necessary measures are taken to ensure women's personal safety in the CAGES/LIFTS (e.g. limiting the number of people transported in cages/lifts).	196	1	5	4.80	0.590
G1.4	All necessary measures are taken to ensure women's personal safety UNDERGROUND (e.g. separate toilet facilities for women and men).	195	1	5	4.82	0.541
G1.5	All necessary measures are taken to ensure women's personal safety in TOILET AND CHANGING FACILITIES (e.g. adequate lighting, locking devices).	196	1	5	4.84	0.530
G1.6	All necessary security measures are taken to ensure women's personal safety when working night shift (e.g. security services).	196	1	5	4.77	0.621
G1.7	Adequate company transport is provided at work to ensure women's safety when working night shifts.	196	1	5	4.52	1.064
G1.8	Adequate lighting facilities are provided to enhance safety for female users when working night shifts.	196	1	5	4.64	0.677
G1.9	The personal protective equipment provided accommodates women's unique body structure.	194	1	5	3.08	1.363
G1.10	The personal protective equipment provided makes sufficient provision for pregnant women (e.g. maternity overalls).	194	1	5	2.19	1.290
G1.11	The personal protective equipment provided is designed to ensure a comfortable fit.	196	1	5	3.15	1.406
G1.12	The personal protective equipment provided assists women to perform their duties safely and efficiently.	195	1	5	4.58	0.823
G1.13	Adequate information is provided to women on how to use personal protective equipment correctly and effectively.	196	1	5	4.76	0.592
G1.14	Women are regularly educated on the maintenance and inspection of their own personal protective equipment.	196	1	5	4.76	0.581
G1.15	All necessary measures are taken to control the risk of dust exposure of workers (e.g. water sprays, fit-for-purpose protective equipment).	196	1	5	4.76	0.574
G1.16	Awareness is created among women regarding the risks in terms of the handling of mining equipment and tools.	196	1	5	4.78	0.564

No.	Item	N	*Min.	*Max.	Mean	*SD
G1.17	Women are educated on the correct methods for handling or moving heavy mining equipment and tools.	196	1	5	4.78	0.564
G1.18	Pregnant women are provided with alternative employment where they are not exposed to hazardous or dangerous conditions.	196	1	5	4.67	0.721
G1.19	Alternative employment is provided for women during early motherhood and breastfeeding.	196	1	5	2.01	1.601
G1.20	The mining organisation is actively involved in HIV/AIDS awareness programmes.	194	1	5	4.82	0.481
G1.21	The mining organisation works to mitigate and combat HIV/AIDS in the mining industry.	196	3	5	4.86	0.379
G1.22	Provision for rehabilitation is made in the case of accidents at work.	196	3	5	4.86	0.418
G1.23	Training and support programmes are provided to women focusing on coping mechanisms for non-work-related demands (e.g. balancing work–life and home–life).	196	2	5	4.81	0.506

*Min. = minimum; *Max. = maximum; *SD = standard deviation

The mean scores of the items ranged between 2.01 and 4.86. The highest mean scores were obtained for QG1.22: “Provision for rehabilitation is made in the case of accidents at work” (M = 4.86), QG1.21: “The mining organisation works to mitigate and combat HIV/AIDS in the mining industry” (M = 4.86) and QG1.5: “All necessary measures are taken to ensure women’s personal safety in toilet and changing facilities (e.g. adequate lighting, locking devices)” (M = 4.84). The lowest mean scores were obtained for QG1.19: “Alternative employment is provided for women during early motherhood and breastfeeding” (M = 2.01) and QG1.10: “The personal protective equipment provided makes sufficient provision for pregnant women (e.g. maternity overalls)” (M = 2.19). Therefore, it is clear that the respondents agreed that the mining company, to some extent, makes provision for the health and safety of women working in mining operations. There is, however, room for improvement in providing alternative employment for women during early motherhood and breastfeeding and providing PPE that makes sufficient provision for pregnant women (e.g. maternity overalls).

5.9.2 Reliability and validity of health and safety considerations

An exploratory factor analysis was conducted on the 23 items of Section G (1) to determine the factor structure of health and safety considerations. The results of the KMO and Bartlett’s test of sphericity are presented in Table 5.31.

Table 5: 31: KMO and Bartlett's test of sphericity: Health and safety considerations

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.905
Bartlett's test of sphericity	Approx. chi-square	5909.977
	*Df	253
	*Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

The KMO measured at 0.905, which indicates that the sample size is adequate for factor analysis (see Kaiser, 1974). The p-value of Bartlett's test of sphericity returned a value smaller than 0.05, suggesting that the correlation between statements is sufficient for factor analysis (Field, 2009:652). The results of the total variance explained are reported in Table 5.32.

Table 5. 32: Total variance explained: Health and safety considerations

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings[a]
	Total	% of variance	Total	Total	% of variance	Cumulative %	Total
1	13.129	57.085	57.085	13.129	57.085	57.085	13.070
2	2.066	8.981	66.065	2.066	8.981	66.065	2.866
3	1.368	5.949	72.014	1.368	5.949	72.014	1.631

Table 5.34 indicates that three factors explain most of the information in the 23 items; these factors explain 57.085%, 8.981% and 5.949% of the total variance, respectively. The pattern matrix in Table 5.33 shows the factor loadings.

Table 5. 33: Pattern matrix: Health and safety considerations

Health and safety considerations				
No.	Item	Factor 1 Adequate health and safety measures	Factor 2 Gender-sensitive PPE	Factor 3 Work practices during motherhood
g1n16	Awareness is created among women regarding the risks in terms of the handling of mining equipment and tools.	0.919		
g1n17	Women are educated on the correct methods for handling or moving heavy mining equipment and tools.	0.918		
g1n13	Adequate information is provided to women on how to use personal protective equipment correctly and effectively.	0.910		
g1n15	All necessary measures are taken to control the risk of dust exposure of workers (e.g. water sprays, fit-for-purpose protective equipment).	0.908		
g1n14	Women are regularly educated on the maintenance and inspection of their own personal protective equipment.	0.906		
g1n22	Provision for rehabilitation is made in the case of accidents at work.	0.903		
g1n5	All necessary measures are taken to ensure women's personal safety in TOILET AND CHANGING FACILITIES (e.g. adequate lighting, locking devices).	0.902		
g1n2	Women are supplied with information about the measures taken to eliminate or minimise these hazards and risks.	0.901		
g1n4	All necessary measures are taken to ensure women's personal safety UNDERGROUND (e.g. separate toilet facilities for women and men).	0.899		
g1n1	Women are supplied with information about the hazards and risks to their health and safety.	0.881		
g1n6	All necessary security measures are taken to ensure women's personal safety when working night shift (e.g. security services).	0.833		
g1n3	All necessary measures are taken to ensure women's personal safety in the CAGES/LIFTS (e.g. limiting the number of people transported in cages/lifts).	0.829		
g1n21	The mining organisation works to mitigate and combat HIV/AIDS in the mining industry.	0.820		
g1n23	Training and support programmes are provided to women focusing on coping mechanisms for non-work-related demands (e.g. balancing work–life and home–life).	0.799		

Health and safety considerations				
No.	Item	Factor 1 Adequate health and safety measures	Factor 2 Gender-sensitive PPE	Factor 3 Work practices during motherhood
g1n18	Pregnant women are provided with alternative employment where they are not exposed to hazardous or dangerous conditions.	0.689		
g1n12	The personal protective equipment provided assists women to perform their duties safely and efficiently.	0.684		
g1n20	The mining organisation is actively involved in HIV/AIDS awareness programmes.	0.660		
g1n8	Adequate lighting facilities are provided to enhance safety for female users when working night shifts.	0.631		-0.301
g1n11	The personal protective equipment provided is designed to ensure a comfortable fit.		0.866	
g1n9	The personal protective equipment provided accommodates women's unique body structure.		0.804	
g1n10	The personal protective equipment provided makes sufficient provision for pregnant women (e.g. maternity overalls).		0.756	
g1n19	Alternative employment is provided for women during early motherhood and breastfeeding.			0.735
g1n7	Adequate company transport is provided at work to ensure women's safety when working night shifts.	0.325		0.734
Cronbach's alpha		0.966	0.761	
Factor mean		4.760	2.823	2.010
Factor standard deviation		0.479	1.128	1.601

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

According to the pattern matrix (see Table. 5.33), all of the items loaded above 0.3 on the three identified factors (Factor 1: Adequate health and safety measures, Factor 2: Gender-sensitive PPE and Factor 3: Work practices during motherhood).

Nineteen items loaded on Factor 1: Adequate health and safety measures; the factor loadings ranged from 0.325 to 0.919. The factor had a mean score of 4.760, which indicates that most respondents agreed that the mining company often makes provision for adequate health and safety measures such as education and training on equipment handling and maintenance,

promoting proper use of PPE, risk control for dust exposure, rehabilitation after accidents, safe toilet and changing facilities, addressing hazards underground, implementing security measures for night shifts, combating HIV/AIDS through awareness programmes, offering support for non-work-related demands, providing alternative employment for pregnant women and supplying adequate transport for women working night shifts. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) rarely, (3) sometimes, (4) often and (5) almost always. The factor shows good reliability and internal consistency with a Cronbach's alpha coefficient of 0.966, which is well above the required 0.7 (see Field, 2009:675).

Three items loaded on Factor 2: Gender-sensitive PPE; the factor loadings ranged from 0.756 to 0.866. The factor had a mean score of 2.823, which indicates that most respondents reported that the mining company rarely makes provision for gender-sensitive PPE that is tailored to ensure a comfortable and secure fit for women, in general, and in particular, for pregnant women. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) rarely, (3) sometimes, (4) often and (5) almost always. The factor had a Cronbach's alpha of 0.761, which shows good reliability and consistency, as it is above the required 0.7 (see Field, 2009:675).

Only one item loaded on Factor 3: Work practices during motherhood; the factor loading was 0.735. The mean score of the factor was 2.010, which indicates that most respondents reported that the mining company rarely implements work practices during motherhood such as providing alternative employment for women during early motherhood and breastfeeding. The factor has no Cronbach's alpha, as only one item loaded on the factor.

5.9.3 Descriptive statistics of PPE fit

Section G (2) of the questionnaire measured the respondents' perceptions regarding the fit of their PPE. A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate extent, (4) to a great extent and (5) don't know. The descriptive statistics are presented in Table 5.34.

Table 5. 34: Descriptive statistics of PPE fit

Descriptive statistics of PPE fit						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
G2.1	Hard hats/Helmets	196	2	4	2.75	0.747
G2.2	Gloves	196	2	4	2.77	0.762
G2.3	Ear plugs	194	2	4	2.76	0.747

No.	Item	N	*Min.	*Max.	Mean	*SD
G2.4	Ear muffs	195	1	4	2.75	0.747
G2.5	Safety shoes/boots	194	1	4	2.52	0.847
G2.6	Gumboots	196	1	4	1.99	1.084
G2.7	Gaiters and foot guards	195	1	4	2.72	0.757
G2.8	Knee guards	195	2	4	2.77	0.746
G2.9	Socks	195	2	4	2.77	0.739
G2.10	Reflective vests	196	2	4	2.78	0.750
G2.11	Dust/Gas masks	195	2	4	2.77	0.739
G2.12	Safety glasses/spectacles/visors	194	2	4	2.76	0.738
G2.13	Overalls (one-piece)	195	1	4	1.73	1.061
G2.14	Overalls (jacket and pants)	192	1	4	2.56	0.790

*Min. = minimum; *Max. = maximum; *SD = standard deviation

Table 5.34 shows that the mean scores of the items ranged between 1.73 and 2.78. The highest mean scores were obtained for QG2.10: “Reflective vests” (M = 2.78). The lowest mean scores were obtained for QG2.13: “Overalls (one-piece)” (M = 1.73). From the mean scores it is evident that, on average, the respondents agreed that the mine, between not at all and to some extent, makes provision for PPE that fits women comfortably; therefore, there is room for improvement in all areas. It is evident from the results that one-piece overalls do not fit women comfortably.

5.9.4 Reliability and validity of PPE fit

An exploratory factor analysis was conducted on the 14 items of G (2) to explore the factor structure of the PPE fit construct. The results of the KMO and Bartlett’s test of sphericity are presented in Table 5.35.

Table 5. 35: KMO and Bartlett’s test of sphericity: PPE fit

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.686
Bartlett's test of sphericity	Approx. chi-square	6578.232
	Df	78
	Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

Table 5.35 shows that the KMO measured 0.686, which is acceptable according to Field (2009:651). The p-value for the Bartlett's test of sphericity was less than 0.05, suggesting statistical significance; this indicated that the correlation between statements was sufficient for exploratory factor analysis (Field, 2009:652). The results of the total variance explained are reported in Table 5.36.

Table 5. 36: Total variance explained: PPE fit

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	10.818	83.216	83.216	10.818	83.216	83.216

Extraction method: principal component analysis

From Table 5.36 it is evident that only one factor was extracted by Kaiser's criteria that explains 83.216% of the total variance of PPE fit. The component matrix presented in Table 5.37 shows the factor loadings.

Table 5. 37: Component matrix: PPE fit

PPE fit		
Question	Item	Factor 1
		PPE fit
g2n12	Safety glasses/spectacles/visors	0.978
g2n3	Ear plugs	0.977
g2n4	Earmuffs	0.972
g2n11	Dust/Gas masks	0.971
g2n8	Knee guards	0.969
g2n9	Socks	0.968
g2n2	Gloves	0.967
g2n7	Gaiters and foot guards	0.966
g2n1	Hard hats/Helmets	0.941
g2n14	Overalls (jacket and pants)	0.895
g2n5	Safety shoes/boots	0.866
g2n6	Gumboots	0.669
g2n13	Overalls (one-piece)	0.627

PPE fit		
Question	Item	Factor 1
		PPE fit
Cronbach's alpha		0.977
Factor mean		2.591
Factor standard deviation		0.724

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

During the factor analysis process multicollinearity was detected among the variables – some of the variables correlate too high. Regression analysis with variance inflation factor was conducted to find out which item should be deleted. A variance inflation factor is a measure of the amount of multicollinearity in regression analysis (Murray *et al*., 2012:161). Values larger than 10 shows high, not tolerable correlation (Murray *et al*. 2012:161), and these cases were therefore excluded from the variable. Applying the decision rule, G2n10 was deleted from the variable PPE fit and factor analysis was repeated.

According to the component matrix (see Table. 5.37), 13 items loaded on the PPE fit factor; the factor loadings ranged between 0.627 to 0.978. The factor shows good reliability and internal consistency with a Cronbach's alpha coefficient of 0.977, which is well above the required 0.7 (see Field, 2009:675). The mean score of the factor was 2.591, which indicates that, on average, the respondents agreed to some extent that the mining company makes provision for PPE that fit women comfortably, such as glasses, ear plugs and earmuffs, dust/gas masks, knee and foot guards, socks and safety shoes/boots, hard hats and overalls (jacket and pants). A five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate extent, (4) to a great extent and (5) don't know.

5.10 WORKPLACE PRACTICES

Section H of the questionnaire determine the respondents' perceptions regarding workplace practices in the mining company with specific reference to women employed in mining operations; the results are discussed below.

5.10.1 Descriptive statistics of workplace practices

To measure the perceived workplace practices, a five-point Likert-type scale consisting of the following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate

extent, (4) to a great extent and (5) don't know. The descriptive statistics are presented in Table 5.38.

Table 5. 38: Descriptive statistics of workplace practices

Descriptive statistics of workplace practices						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
H1	Men and women are treated FAIRLY in the workplace (e.g. in terms of promotions and development opportunities).	196	2	5	3.45	0.634
H2	Men and women are treated EQUALLY in the workplace (e.g. in terms of promotions and development opportunities).	196	1	5	3.36	0.692
H3	Leadership supports the acquisition of new skills irrespective of gender.	195	1	4	3.27	0.626
H4	Female employees are accepted by their MALE CO-WORKERS.	196	1	5	3.26	0.671
H5	Female employees are accepted by mining WORK TEAMS.	195	1	4	3.25	0.668
H6	Stereotypes such as 'mining is not a place for women' are still present.	196	1	5	2.32	0.836
H7	Women are underestimated by male co-workers (e.g. in terms of their skills and capabilities to lead and manage).	196	1	4	2.46	0.787
H8	Men do not readily take instructions from female employees.	195	1	5	2.04	1.012
H9	Men treat women disrespectfully in the workplace.	196	1	5	2.06	0.833
H10	The mining organisation values gender diversity.	196	1	5	3.14	0.996
H11	Women's inputs are appreciated in the organisation.	196	1	5	3.15	0.996
H12	Women are involved in decision-making processes.	196	1	5	3.18	0.879
H13	Women feel isolated in work teams.	195	1	5	2.15	0.960
H14	Sex in the workplace in exchange for favours is commonly practised in the mining organisation.	196	1	5	3.14	1.340
H15	Sexual harassment is a problem in the workplace (e.g. threats, demands, bodily contact).	196	1	5	3.72	0.684

Descriptive statistics of workplace practices						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
H16	Regular awareness campaigns for sexual harassment are provided.	196	1	4	3.61	0.644
H17	Regular training is provided on the procedures to follow if sexual harassment occurs.	196	1	4	3.63	0.597
H18	Sexual harassment complaints are effectively investigated.	196	1	4	3.64	0.605
H19	Pregnant women are treated well from the moment they disclose their pregnancy (e.g. employment in alternative positions requiring light duty).	196	1	4	3.61	0.627
H20	The mining organisation has an effective channel for women to voice their concerns to management (e.g. the Women in Mining Forum).	196	1	4	3.62	0.599
H21	Trade unions are essential for improving conditions for women at the mining organisation.	196	1	4	3.79	0.511
H22	Management effectively responds to women's concerns in the organisation.	196	1	4	3.61	0.626

*Min. = minimum; *Max. = maximum; *SD = standard deviation

Table 5.38 shows that the mean scores of the items ranged between 2.04 and 3.79. The highest mean scores were obtained for QH21: "Trade unions are essential for improving conditions for women at the mining organisation" (M = 3.79) and QH15: "Sexual harassment is a problem in the workplace (e.g. threats, demands, bodily contact)" (M = 3.72). The lowest mean scores were obtained for QH9: "Men treat women disrespectfully in the workplace" (M = 2.06) and QH13: "Women feel isolated in work teams" (M = 2.15). The factor mean scores are interpreted under 5.3.8.2. The standard deviation of the items ranged between 0.511 and 1.340.

5.10.2 Reliability and validity of workplace practices

An exploratory factor analysis was conducted on the 22 items of Section H (1) to determine the factor structure of workplace practices. The results of the KMO and Bartlett's test of sphericity are presented in Table 5.39.

Table 5. 39: KMO and Bartlett's test of sphericity: Workplace practices

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.843
Bartlett's test of sphericity	Approx. chi-square	2976.095
	Df	210
	Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

The KMO measured 0.843, which indicates that the sample size is adequate for factor analysis (see Kaiser, 1974). The p-value for the Bartlett's test of sphericity was less than 0.05, suggesting statistical significance; this indicated that the correlation between statements was sufficient for exploratory factor analysis (see Field, 2009:652). Table 5.40 presents the total variance explained for workplace practices.

Table 5. 40: Total variance explained: Workplace practices

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings[a]
	Total	% of variance		Total	% of variance	Cumulative %	Total
1	9.563	45.540	45.540	9.563	45.540	45.540	7.721
2	2.560	12.190	57.730	2.560	12.190	57.730	6.943
3	2.196	10.456	68.186	2.196	10.456	68.186	3.336
4	1.354	6.449	74.635	1.354	6.449	74.635	2.539

From Table 5.40 it is evident that four factors were extracted by Kaiser's criteria that explain the total variance of workplace practices. The pattern matrix in Table 5.41 shows the factor loadings.

Table 5. 41: Pattern matrix: Workplace practices

Workplace practices					
No.	Item	Factor 1 Conducive work environment	Factor 2 Inclusive workplace practices	Factor 3 Gender bias	Factor 4 Quid pro quo harassment
h1n17	Regular training is provided on the procedures to follow if sexual harassment occurs.	0.933			
h1n16	Regular awareness campaigns for sexual harassment are provided.	0.909			
h1n19	Pregnant women are treated well from the moment they disclose their pregnancy (e.g. employment in alternative positions requiring light duty).	0.867			
h1n20	The mining organisation has an effective channel for women to voice their concerns to management (e.g. the Women in Mining Forum).	0.852			
h1n18	Sexual harassment complaints are effectively investigated.	0.837			
h1n21	Trade unions are essential for improving conditions for women at the mining organisation	0.786			
h1n22	Management effectively responds to women's concerns in the organisation.	0.777			
h1n4	Female employees are accepted by their MALE CO-WORKERS		0.967		
h1n5	Female employees are accepted by mining WORK TEAMS.		0.964		
h1n3	Leadership supports the acquisition of new skills irrespective of gender.		0.961		
h1n2	Men and women are treated EQUALLY in the workplace (e.g. in terms of promotions and development opportunities).		0.873		
h1n1	Men and women are treated FAIRLY in the workplace (e.g. in terms of promotions and development opportunities).		0.866		
h1n7	Women are underestimated by male co-workers (e.g. in terms of their skills and capabilities to lead and manage).			0.804	

Workplace practices					
No.	Item	Factor 1 Conducive work environment	Factor 2 Inclusive workplace practices	Factor 3 Gender bias	Factor 4 Quid pro quo harassment
h1n6	Stereotypes such as 'mining is not a place for women' are still present.			0.774	
h1n9	Men treat women disrespectfully in the workplace.			0.711	
h1n8	Men do not readily take instructions from female employees.			0.627	
h1n13	Women feel isolated in work teams.			0.544	
h1n10	The mining organisation values gender diversity.	0.371			-0.655
h1n11	Women's inputs are appreciated in the organisation.		0.361		-0.644
h1n12	Women are involved in decision-making processes.		0.419		-0.538
h1n14	Sex in the workplace in exchange for favours is commonly practised in the mining organisation.				0.513
Cronbach's alpha		0.931	0.932	0.760	
Factor mean		3.578	3.259	2.187	2.362
Factor standard deviation		0.543	0.613	0.626	0.693

Extraction method: principal component analysis
Rotation method: oblimin with Kaiser normalisation

According to the pattern matrix (see Table. 5.41), all of the items loaded above 0.3 on the four identified factors (Factor 1: Conducive work environment, Factor 2: Inclusive workplace practices, Factor 3: Gender bias and Factor 4: Quid pro quo harassment).

Eight items loaded on Factor 1: Conducive work environment; the factor loadings ranged from 0.371 to 0.933. The factor shows good reliability and internal consistency with a Cronbach's alpha coefficient of 0.931, which is well above the required 0.7 (see Field, 2009:675). The factor had a mean score of 3.578, which indicates that the respondents agreed to a moderate extent that the mining company provides a conducive work environment for women by addressing sexual harassment, treating pregnant women with respect and effectively responds to women's concerns in the company. A five-point Likert-type scale consisting of the

following response categories was used: (1) not at all, (2) to some extent, (3) to a moderate extent, (4) to a great extent and (5) don't know.

Seven items loaded on Factor 2: Inclusive workplace practices; the factor loadings ranged between 0.361 and 0.967. The factor had a Cronbach's alpha of 0.932, which shows good reliability and internal consistency, as it is above the required 0.7 (see Field, 2009:675). The factor had a mean score of 3.259, indicating that the respondents agreed to a moderate extent that the mining company promotes inclusive workplace practices such as encouraging skills acquisition regardless of gender and ensuring fair and equal treatment during promotions and development opportunities.

Five items loaded on Factor 3: Gender bias; the factor loadings ranged between 0.544 and 0.804. The factor had a Cronbach's alpha coefficient of 0.760 and shows high reliability and internal consistency (see Field, 2009:675). The factor had a mean score of 2.187, indicating that on average, the respondents indicated that women, to some extent, are still subjected to challenges in the workplace such as the undermining of women by men, stereotypes, reluctance of men to take instruction from female employees, disrespectful treatment and isolation.

Only one item loaded on Factor 4: Quid pro quo harassment; the factor loading was 0.513. The mean score of the factor was 2.362, which means that the respondents agreed, to some extent, that there is quid pro quo harassment (sexual favouritism) in the mining company, such as the common practice of sex being exchanged for favours.

5.11 PERSONAL INFORMATION

Section I of the questionnaire aimed to determine the influence of work at the mining company on various personal life factors.

5.11.1 Descriptive statistics of women's work at the mine and their personal lives

Section I (1) of the questionnaire aimed to determine the effect of the respondents' work at the mining company on their personal life, such as their family life, community involvement, health and wellness as well as their relationships with their friends and family. A four-point Likert-type scale consisting of the following response categories was used: (1) negative influence, (2) no influence, (3) positive influence and (4) not applicable. The results are presented in Table 5.42.

Table 5. 42: Descriptive statistics of women's work at the mine and their personal lives

Descriptive statistics of women's work at the mine and their personal lives						
No.	**Item**	**N**	***Min.**	***Max.**	**Mean**	***SD**
I1	Childcare responsibilities	196	1	4	2.51	0.603
I2	Children's developmental problems	196	1	4	2.19	0.599
I3	Marital conflict/Conflict with partner	196	1	4	2.22	0.633
I4	Community involvement	195	1	4	2.15	0.572
I5	Health and wellness	195	1	4	1.37	0.701
I6	Relationship with friends and family	194	1	4	2.24	0.598

*Min. = minimum; *Max. = maximum; Mean; SD = standard deviation

Table 5.42 shows that the mean scores of the items ranged between 1.37 (negative influence) and 2.51 (no influence). The highest mean scores were obtained for QI1: "Childcare responsibilities" (M = 2.51). The lowest mean scores were obtained for QI5: "Health and wellness" (M = 1.37). From the mean scores, it can be deduced that women's work at the mine compromise their health and safety to some extent.

5.11.2 Reliability and validity of women's work at the mine and their personal lives

An exploratory factor analysis was conducted on the six items of Section I (1) to determine the factor structure of women's work at the mine and their personal lives. The results of the KMO and Bartlett's test of sphericity are presented in Table 5.43.

Table 5. 43: KMO and Bartlett's test of sphericity: Women's work at the mine and their personal lives

KMO and Bartlett's test		
KMO measure of sampling adequacy		0.755
Bartlett's test of sphericity	Approx. chi-square	398.288
	*Df	15
	*Sig.	0.000

*Df = Degrees of freedom; *Sig. = Statistical significance

The KMO measured 0.755, which indicates that the sample size is adequate for factor analysis (see Kaiser, 1974). The p-value of Bartlett's test of sphericity returned a value smaller than 0.05, suggesting that the correlation between statements is sufficient for factor analysis (see

Field, 2009:652). Table 5.44 presents the total variance explained for women's work at the mine and their personal lives.

Table 5. 44: Total variance explained: Women's work at the mine and their personal lives

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.024	50.399	50.399	3.024	50.399	50.399

Extraction method: principal component analysis

Table 5.44 indicates that only one factor explains 50.399% of the total variance. The component matrix presented below in Table 5.45 shows the factor loadings.

Table 5. 45: Component matrix: Women's work at the mine and their personal lives

Women's work at the mine and their personal lives		
Question	Item	Factor 1
		Women's work at the mine and their personal lives
i1n6	Relationship with friends and family	0.820
i1n4	Community involvement	0.818
i1n3	Marital conflict/Conflict with partner	0.806
i1n2	Children's developmental problems	0.776
i1n5	Health and wellness	0.555
i1n1	Childcare responsibilities	0.351
Cronbach's alpha		0.746
Factor mean		2.019
Factor standard deviation		0.351

Extraction method: principal component analysis

According to the component matrix (see Table. 5.45), six items loaded on the women's work at the mine and their personal lives factor; the factor loadings ranged between 0.351 and 0.820. The factor shows good reliability and internal consistency with a Cronbach's alpha coefficient of 0.746, which is above the required 0.7 (see Field, 2009:675). The mean score of the factor was 2.019, indicating that on average, the respondents reported that women's work

at the mine do not significantly affect their personal lives relating to encouraging marital/partner conflict, influencing their childcare responsibilities, their community involvement, their relationship with their friends and family and their overall health and wellness; however, neither does their work at the mine influence their personal lives positively. A four-point Likert-type scale consisting of the following response categories was used: (1) negative influence, (2) no influence, (3) positive influence and (4) not applicable.

5.12 CHAPTER SUMMARY

This chapter presented and discussed the empirical results and analysis of the quantitative data. First, the implementation of the research methodology was elaborated on. Second, the socio-demographic information of the respondents was presented and discussed. The sample consisted of 196 women employed in mining operations in different occupations at a platinum mine in South Africa. Their biographical data captured information regarding age, race, marital status, number of children, highest qualification, place of work at the mine, requirement to work night shifts, duration of working in the mining environment, level of employment, primary role at the mine and primary reason for selecting a career in mining. Third, the descriptive statistics and the results of the exploratory factor analyses related to the working conditions of women employed in mining operations were presented and discussed. The exploratory factor analysis revealed numerous factors that explain the working conditions of women employed in mining operations at the mining company. Development opportunities were identified as a singular factor. Infrastructure facilities on the surface were differentiated into two factors: the first encompassing workplace amenities for female miners and the second focusing on childcare and breastfeeding facilities. A single factor emerged in the underground infrastructure category, reflecting ablution facilities underground. Physical proficiency abilities revealed three factors: appointment practices, women's physical capacity and women's physical challenges. Health and safety considerations yielded three factors: adequate health and safety, gender-sensitive PPE and work practices during motherhood. The assessment of PPE fit resulted in a single factor. Workplace practices yielded four factors: conducive work environment, inclusive workplace practices, gender bias and quid pro quo harassment. Finally, in the personal category, a single factor encapsulated women's work at the mine and their personal lives. All factors showed adequate reliability and internal consistency. The following chapter presents the empirical results of the inferential statistics and discusses and interprets the results in terms of the literature review.

CHAPTER SIX

EMPIRICAL RESULTS: INFERENTIAL STATISTICS, AND DISCUSSION AND INTERPRETATION OF THE RESULTS

6.1 INTRODUCTION

The previous chapter presented an overview of the study's research methodology, the socio-demographic information of the respondents and the descriptive statistics, reliability and validity of the variables used in the study. This chapter presents and discusses the results of the inferential statistics and interprets the results of the study in terms of the literature reviewed. Inferential statistics were explored to get a complete understanding of the variables influencing the working conditions of women employed in mining operations at the mining company under investigation.

6.2 THE ASSOCIATION BETWEEN SOCIO-DEMOGRAPHIC VARIABLES AND THE WORKING CONDITIONS OF WOMEN EMPLOYED IN MINING OPERATIONS

Independent samples t-tests were conducted on the following variables to determine whether there was an association between these variables and the factors related to the working conditions of women employed in mining operations: the requirement to work night shifts and participation in work committees. The results are presented below.

6.2.1 The association between the requirement to work night shifts and the working conditions of women employed in mining operations

Table 6.1 shows the results of the independent samples t-tests for the requirement to work night shifts and the factors related to the working conditions of women employed in mining operations.

Table 6. 1: The association between the requirement to work night shifts and the working conditions of women employed in mining operations

Group statistics					Independent samples test	Effect size
		N	Mean	Standard deviation	P-value	
Development opportunities	Yes	35	3.35	0.99	0.067	0.34
	No	161	3.00	1.01		
Workplace amenities for female miners	Yes	35	2.93	0.51	0.872	0.03
	No	161	2.92	0.51		

Group statistics					Independent samples test	Effect size
		N	Mean	Standard deviation	P-value	
Childcare and breastfeeding facilities	Yes	33	1.48	0.87	0.042	0.57
	No	159	1.15	0.51		
Ablution facilities underground	Yes	34	2.53	0.70	0.119	0.37
	No	159	2.33	0.50		
Appointment practices	Yes	35	3.77	0.65	0.081	0.33
	No	161	3.95	0.52		
Women's physical capacity	Yes	35	3.85	0.66	0.001	0.66
	No	161	4.25	0.58		
Women's physical challenges	Yes	35	4.42	0.58	0.066	0.34
	No	161	4.22	0.57		
Adequate health and safety measures	Yes	35	4.76	0.46	0.985	0.00
	No	161	4.76	0.48		
Gender-sensitive PPE	Yes	35	3.10	0.92	0.062	0.31
	No	161	2.76	1.16		
Work practices during motherhood	Yes	35	2.29	1.71	0.262	0.21
	No	161	1.95	1.58		
PPE fit	Yes	35	2.84	0.83	0.054	0.42
	No	161	2.54	0.69		
Conducive work environment	Yes	35	3.88	0.23	0.00	0.69
	No	161	3.51	0.57		
Inclusive workplace practices	Yes	35	3.46	0.64	0.031	0.41
	No	161	3.21	0.60		
Gender bias	Yes	35	2.03	0.67	0.093	0.32
	No	161	2.22	0.61		
Quid pro quo harassment	Yes	20	2.60	0.99	0.239	0.40
	No	118	2.32	0.63		
Women's work at the mine and their personal lives	Yes	34	2.05	0.48	0.668	0.11
	No	158	2.01	0.32		

Cohen's d-values: small effect: d = 0.2; medium effect: d = 0.5; large effect: d = 0.8

The results of the independent samples t-test (see Table 6.1) showed statistically significant differences between the mean scores of the yes and no categories for childcare and breastfeeding facilities (p = 0.042; d = 0.57), women's physical capacity (p = 0.001; d = 0.66), conducive work environment (p = 0.00; d = 0.69) and inclusive workplace practices (p = 0.031; d = 0.41). The effect sizes showed a medium effect. The respondents who were required to work night shifts were more optimistic about the childcare and breastfeeding facilities provided by the mining company (Yes: M = 1.48; No: M = 1.15), the conduciveness of the work environment to accommodate women employed in mining operations (Yes: M = 3.88; No: M

= 3.51) and the inclusiveness of the workplace practices of the mining company (Yes: M = 3.46; No: M = 3.21), and less optimistic about their physical capacity to operate heavy machinery and/or vibrating power tools (Yes: M = 3.85; No: M = 4.25).

6.2.2 The association between participation in work committee and the working conditions of women employed in mining operations

Table 6.2 shows the results of the independent samples t-tests for participation in work committee and the factors related to the working conditions of women employed in mining operations.

Table 6. 2: The association between the participation in work committee and the working conditions of women employed in mining operations

Group statistics					Independent samples test	Effect size
		N	Mean	Standard deviation	P-value	
Development opportunities	Yes	36	3.24	1.16	0.326	0.20
	No	160	3.03	0.98		
Workplace amenities for female miners	Yes	36	2.95	0.66	0.670	0.08
	No	160	2.91	0.47		
Childcare and breastfeeding facilities	Yes	34	1.43	0.78	0.070	0.45
	No	158	1.16	0.54		
Ablution facilities underground	Yes	36	2.44	0.68	0.464	0.16
	No	157	2.35	0.51		
Appointment practices	Yes	36	3.71	0.67	0.034	0.48
	No	160	3.97	0.51		
Women's physical capacity	Yes	36	4.25	0.61	0.432	0.15
	No	160	4.16	0.62		
Women's physical challenges	Yes	36	4.07	0.52	0.033	0.40
	No	160	4.30	0.58		
Adequate health and safety measures	Yes	36	4.63	0.81	0.241	0.35
	No	160	4.79	0.36		
Gender-sensitive PPE	Yes	36	2.71	1.15	0.518	0.12
	No	160	2.85	1.13		
Work practices during motherhood	Yes	36	2.31	1.77	0.263	0.23
	No	160	1.94	1.56		
PPE fit	Yes	36	2.92	0.91	0.015	0.58
	No	160	2.52	0.66		
Conducive work environment	Yes	36	3.48	0.74	0.351	0.22
	No	160	3.60	0.49		
Inclusive workplace practices	Yes	36	3.27	0.73	0.951	0.01
	No	160	3.26	0.59		
Gender bias	Yes	36	2.08	0.77	0.272	0.20

Group statistics					Independent samples test	Effect size
		N	Mean	Standard deviation	P-value	
	No	160	2.21	0.59		
Quid pro quo harassment	Yes	25	2.40	0.76	0.765	0.07
	No	113	2.35	0.68		
Women's work at the mine and their personal lives	Yes	35	2.12	0.47	0.165	0.34
	No	157	2.00	0.32		

Cohen's d-values: small effect: d = 0.2; medium effect: d = 0.5; large effect: d = 0.8

The results of the independent samples t-tests (see Table 6.2) showed statistically significant differences between the mean scores of the yes and no categories for appointment practices (p = 0.034; d = 0.48), women's physical challenges (p = 0.033; d = 0.40) and PPE fit (p = 0.015; d = 0.58). The effect sizes showed a small to medium effect. The respondents who participated in work committees expressed more favourable opinions regarding the comfort of their PPE fit (e.g. ear plugs, gloves, boots and overalls) (Yes: M = 2.92; No: M = 2.52) and less favourable opinions regarding appointment practices at the mine (e.g. women's size and body build being considered when allocating them positions) (Yes: M = 3.71; No: M = 3.97) and the challenges women experience, including the effects of the labour-intensive work on women (Yes: M = 4.07; No: M = 4.30).

In addition to the independent sample t-test, ANOVA tests were conducted to investigate the association between biographical variables and the factors related to the working conditions of women employed in mining operations; these are discussed below.

6.2.3 The association between the marital status and the working conditions of women employed in mining operations

One-way ANOVA tests were conducted on the following variables to determine whether there was an association between these variables and the factors related to the working conditions of women employed in mining operations: marital status, place of work at the mine and the primary reason why they selected a career in mining. Note that effect sizes were interpreted, and not post hoc tests, to determine whether the differences between the categories were important in practice. Schuele and Justice (2006:14–27) suggest that effect size can be used to interpret the difference between means. The results are presented below.

Table 6.3 shows the results of the one-way ANOVA for the association between marital status and the factors related to the working conditions of women employed in mining operations. Marital status comprised four groups: single and not in a relationship, unmarried and in a relationship, widowed/divorced and married/remarried.

Table 6. 3: The association between the marital status and the working conditions of women employed in mining operations

Group statistics					ANOVA	Effect size		
Marital status		N	Mean	*SD	P-value	A with	B with	C with
Development opportunities	A: Single and not in a relationship	43	3.45	0.94	0.025			
	B: Unmarried and in a relationship	68	2.93	0.94		0.55		
	C: Widowed/Divorced	12	3.25	1.14		0.18	0.27	
	D: Married/Remarried	73	2.92	1.04		0.51	0.01	0.28
	Total	196	3.06	1.01				
Workplace amenities for female miners	A: Single and not in a relationship	43	2.98	0.54	0.631			
	B: Unmarried and in a relationship	68	2.93	0.55		0.09		
	C: Widowed/Divorced	12	2.88	0.52		0.18	0.09	
	D: Married/Remarried	73	2.86	0.44		0.23	0.13	0.04
	Total	196	2.91	0.51				
Childcare and breastfeeding facilities	A: Single and not in a relationship	42	1.21	0.60	0.952			
	B: Unmarried and in a relationship	66	1.23	0.65		0.03		
	C: Widowed/Divorced	12	1.25	0.62		0.06	0.02	
	D: Married/Remarried	72	1.18	0.53		0.06	0.08	0.11
	Total	192	1.21	0.59				
Ablution facilities underground	A: Single and not in a relationship	42	2.42	0.61	0.322			
	B: Unmarried and in a relationship	68	2.35	0.58		0.12		
	C: Widowed/Divorced	12	2.58	0.74		0.21	0.31	
	D: Married/Remarried	71	2.29	0.41		0.21	0.09	0.38
	Total	193	2.36	0.54				
Appointment practices	A: Single and not in a relationship	43	3.93	0.54	0.404			
	B: Unmarried and in a relationship	68	3.87	0.56		0.11		
	C: Widowed/Divorced	12	4.16	0.43		0.41	0.51	
	D: Married/Remarried	73	3.90	0.54		0.06	0.05	0.48
	Total	196	3.91	0.55				

Group statistics					ANOVA	Effect size		
Marital status		N	Mean	*SD	P-value	A with	B with	C with
Women's physical capacity	A: Single and not in a relationship	43	4.02	0.55	0.065			
	B: Unmarried and in a relationship	68	4.25	0.58		0.40		
	C: Widowed/Divorced	12	3.89	0.60		0.21	0.59	
	D: Married/Remarried	73	4.24	0.66		0.34	0.02	0.52
	Total	196	4.17	0.61				
Women's physical challenges	A: Single and not in a relationship	43	4.40	0.53	0.235			
	B: Unmarried and in a relationship	68	4.18	0.63		0.35		
	C: Widowed/Divorced	12	4.15	0.44		0.46	0.05	
	D: Married/Remarried	73	4.25	0.54		0.27	0.11	0.18
	Total	196	4.25	0.57				
Adequate health and safety measures	A: Single and not in a relationship	43	4.78	0.56	0.428			
	B: Unmarried and in a relationship	68	4.76	0.48		0.03		
	C: Widowed/Divorced	12	4.95	0.08		0.30	0.39	
	D: Married/Remarried	73	4.71	0.45		0.13	0.11	0.53
	Total	196	4.75	0.47				
Gender-sensitive PPE	A: Single and not in a relationship	43	3.00	1.28	0.334			
	B: Unmarried and in a relationship	68	2.91	1.11		0.07		
	C: Widowed/Divorced	12	2.72	1.07		0.22	0.17	
	D: Married/Remarried	73	2.64	1.04		0.28	0.24	0.07
	Total	196	2.82	1.12				
Work practices during motherhood	A: Single and not in a relationship	43	2.48	1.89	0.065			
	B: Unmarried and in a relationship	68	2.05	1.61		0.23		
	C: Widowed/Divorced	12	2.08	1.78		0.21	0.01	
	D: Married/Remarried	73	1.67	1.30		0.43	0.24	0.23
	Total	196	2.01	1.60				
PPE fit	A: Single and not in a relationship	43	2.70	0.76				

Group statistics					ANOVA	Effect size		
Marital status		N	Mean	*SD	P-value	A with	B with	C with
	B: Unmarried and in a relationship	68	2.65	0.74	0.098	0.07		
	C: Widowed/Divorced	12	2.80	0.94		0.11	0.16	
	D: Married/Remarried	73	2.43	0.61		0.36	0.30	0.40
	Total	196	2.59	0.72				
Conducive work environment	A: Single and not in a relationship	43	3.65	0.66	0.688			
	B: Unmarried and in a relationship	68	3.53	0.56		0.18		
	C: Widowed/Divorced	12	3.64	0.48		0.01	0.19	
	D: Married/Remarried	73	3.56	0.45		0.14	0.04	0.17
	Total	196	3.57	0.54				
Inclusive workplace practices	A: Single and not in a relationship	43	3.3389	0.71089	0.681			
	B: Unmarried and in a relationship	68	3.24	0.64		0.13		
	C: Widowed/Divorced	12	3.34	0.62		0.01	0.15	
	D: Married/Remarried	73	3.20	0.51		0.19	0.06	0.22
	Total	196	3.25	0.61				
Gender bias	A: Single and not in a relationship	43	2.01	0.62	0.023			
	B: Unmarried and in a relationship	68	2.22	0.67		0.31		
	C: Widowed/Divorced	12	1.85	0.64		0.26	0.56	
	D: Married/Remarried	73	2.30	0.54		0.46	0.11	0.70
	Total	196	2.18	0.62				
Quid pro quo harassment	A: Single and not in a relationship	28	2.21	0.73	0.089			
	B: Unmarried and in a relationship	48	2.35	0.69		0.19		
	C: Widowed/Divorced	9	2.88	0.60		0.91	0.76	
	D: Married/Remarried	53	2.35	0.65		0.20	0.01	0.81
	Total	138	2.36	0.69				
Women's work at the mine and their personal lives	A: Single and not in a relationship	42	2.05	0.34	0.544			
	B: Unmarried and in a relationship	65	1.99	0.38		0.17		

Group statistics					ANOVA	Effect size		
Marital status		N	Mean	*SD	P-value	A with	B with	C with
	C: Widowed/Divorced	12	1.91	0.25		0.41	0.20	
	D: Married/Remarried	73	2.03	0.33		0.06	0.12	0.36
	Total	192	2.01	0.35				

*SD: Standard deviation

Cohen's d-values: small effect: d = 0.2; medium effect: d = 0.5; large effect: d = 0.8

The results of the ANOVA test revealed a statistically significant difference between the mean scores of the marital status categories for development opportunities (p = 0.025) and gender bias (p = 0.023).

The results showed that the respondents who were single and not in a relationship (M = 3.45) were more positive about their company's offering of development opportunities compared to the respondents who were unmarried and in a relationship (M = 2.93; d = 0.55) and married/remarried (M = 2.92; d = 0.51). The effect sizes showed a medium effect. This suggests that they perceive these opportunities more favourably compared to women in other relationship statuses. Furthermore, the respondents who were widowed/divorced (M = 3.25; d = 0.27) were more positive about the mining company's development opportunities than those who were unmarried and in a relationship (M = 2.93; d = 0.55) and those who were married/remarried (M = 2.92; d = 0.28). The effect sizes showed a small to medium effect. The average scores are around 3, indicating a somewhat positive perception of development opportunities overall.

The effect sizes further showed that the respondents who were single and not in a relationship (M = 2.01) experienced slightly less gender bias than those who were unmarried and in a relationship (M = 2.22; d = 0.31) and married (M = 2.30; d = 0.46), and slightly more challenges than those who were widowed/divorced (M = 1.85; d = 0.26); the effect sizes showed a small to medium effect. Furthermore, the respondents who were widowed/divorced (M = 1.85; d = 0.26) also experienced less gender bias than those who were unmarried and in a relationship (M = 2.22; d = 0.56) and married (M = 2.30; d = 0.70).

6.2.4 The association between the place of work at the mine and the working conditions of women employed in mining operations

Table 6.4 shows the results of the one-way ANOVA test for place of work at the mine on the factors related to the working conditions in mining operations. The variable comprised three categories: underground, surface, and underground and surface.

Table 6. 4: The association between the place of work at the mine and the working conditions of women employed in mining operations

Group statistics					ANOVA	Effect size	
Place of work at the mine		N	Mean	*SD	P-value	A with	B with
Development Opportunities	A: Underground	172	3.03	1.00	0.276	0.39	0.08	0.46
	B: On the surface	12	3.50	1.21			
	C: Underground and on the surface	10	2.95	0.84			
	Total	194	3.05	1.01			
Workplace amenities for female miners	A: Underground	172	2.93	0.47	0.059	0.29	0.34	0.47
	B: On the surface	12	3.07	0.29			
	C: Underground and on the surface	10	2.57	1.06			
	Total	194	2.92	0.51			
Childcare and breastfeeding facilities	A: Underground	169	1.17	0.52	0.010	0.51	0.27	0.22
	B: On the surface	12	1.67	0.98			
	C: Underground and on the surface	9	1.44	1.01			
	Total	190	1.21	0.60			
Ablution facilities underground	A: Underground	172	2.33	0.49	0.011	0.80	0.17	0.33
	B: On the surface	9	2.86	0.67			
	C: Underground and on the surface	10	2.51	1.07			
	Total	191	2.36	0.55			
Appointment practices	A: Underground	172	3.94	0.54	0.164	0.48	0.25	0.25
	B: On the surface	12	3.65	0.61			
	C: Underground and on the surface	10	3.80	0.56			
	Total	194	3.92	0.55			
Women's physical capacity	A: Underground	172	4.19	0.60	0.271	0.13	0.36	0.47
	B: On the surface	12	4.28	0.69			
	C: Underground and on the surface	10	3.89	0.83			
	Total	194	4.18	0.62			
Women's physical challenges	A: Underground	172	4.26	0.57	0.694	0.12	0.17	0.09
	B: On the surface	12	4.19	0.45			
	C: Underground and on the surface	10	4.12	0.85			

Group statistics					ANOVA	Effect size	
Place of work at the mine		N	Mean	*SD	P-value	A with	B with
	Total	194	4.25	0.57			
Adequate health and safety measures	A: Underground	172	4.79	0.35	0.000		
	B: On the surface	12	4.93	0.11		0.42	
	C: Underground and on the surface	10	4.01	1.40		0.55	0.66
	Total	194	4.76	0.48			
Gender-sensitive PPE	A: Underground	172	2.84	1.14	0.660		
	B: On the surface	12	2.81	0.99		0.03	
	C: Underground and on the surface	10	2.50	1.16		0.29	0.26
	Total	194	2.82	1.13			
Work practices during motherhood	A: Underground	172	1.98	1.57	0.348		
	B: On the surface	12	2.67	2.06		0.33	
	C: Underground and on the surface	10	1.90	1.66		0.05	0.37
	Total	194	2.02	1.61			
PPE fit	A: Underground	172	2.56	0.69	0.097		
	B: On the surface	12	2.72	0.98		0.17	
	C: Underground and on the surface	10	3.05	0.87		0.56	0.33
	Total	194	2.59	0.73			
Conducive work environment	A: Underground	172	3.58	0.50	0.142		
	B: On the surface	12	3.72	0.40		0.28	
	C: Underground and on the surface	10	3.28	1.15		0.27	0.39
	Total	194	3.57	0.54			
Inclusive workplace practices	A: Underground	172	3.23	0.59	0.016		
	B: On the surface	12	3.74	0.36		0.87	
	C: Underground and on the surface	10	3.14	0.95		0.09	0.62
	Total	194	3.25	0.61			
Workplace challenges	A: Underground	172	2.20	0.61	0.091		
	B: On the surface	12	1.82	0.63		0.61	
	C: Underground and on the surface	10	2.33	0.79		0.16	0.65
	Total	194	2.18	0.63			

Group statistics					ANOVA	Effect size	
Place of work at the mine		N	Mean	*SD	P-value	A with	B with
Quid pro quo harassment	A: Underground	123	2.33	0.65	0.003		
	B: On the surface	7	3.14	0.69		1.17	
	C: Underground and on the surface	6	2.00	0.63		0.51	1.66
	Total	136	2.36	0.67			
Women's work at the mine and their personal lives	A: Underground	169	2.02	0.32	0.559		
	B: On the surface	11	2.08	0.55		0.12	
	C: Underground and on the surface	10	1.92	0.62		0.16	0.27
	Total	190	2.02	0.35			

*SD: Standard deviation

Cohen's d-values: small effect: d = 0.2; medium effect: d = 0.5; large effect: d = 0.8

The results of the ANOVA test revealed significant differences between the mean scores of the place of work at the mine categories for childcare and breastfeeding facilities (p = 0.010), ablution facilities underground (p = 0.011), adequate health and safety measures (p = 0.000), inclusive workplace practices (p = 0.016) and quid pro quo harassment (sexual favouritism) (p = 0.003).

The results are discussed below.

Although the overall mean score of the childcare and breastfeeding facilities was 1.21, indicating that the mining company did not provide childcare and breastfeeding facilities according to the respondents, the effect sizes showed that the respondents who worked on the surface (M = 1,67; d = 0.51) and both underground and on the surface (M = 1.44; d = 0.27) were slightly more optimistic, with scores leaning closer to "To some extent" about childcare and breastfeeding facilities provided than those who only worked underground (M = 1.17). The effect sizes further showed a small to medium effect. Furthermore, the respondents who worked on the surface (M = 1.67; d = 0.51) had a more favourable assessment of the childcare and breastfeeding facilities provided than those who worked underground and on the surface (M = 1.44; d = 0.22). The effect sizes also showed that the difference between the mean scores were small.

The respondents who worked on the surface (M = 2.86; d = 0.80) had a more favourable assessment of the ablution facilities provided underground than those who worked underground (M = 2.33) and underground and on the surface (M = 2.51; d = 0.33). These

scores fall between “To some extent” and “To a moderate extent”, suggesting some room for improvement across all locations. The effect sizes showed a small to large effect.

The respondents who worked underground (M = 4.79) were less optimistic about the provision of adequate health and safety measures than those who worked on the surface (M = 4.93; d = 0.42) and more optimistic than those who worked underground and on the surface (M = 4.01; d = 0.55). Furthermore, the respondents who worked on the surface (M = 4.93) were more optimistic about the provision of adequate health and safety measures than those who worked underground and on the surface (M = 4.01; d = 0.66). The effect sizes showed a small to medium effect.

The respondents who worked on the surface (M = 3.74; d = 0.87) were more positive about the mine’s inclusive workplace practices than those who worked underground (M = 3.23; d = 0.87) and underground and on the surface (M = 3.14; d = 0.62). The effect sizes showed a medium to large effect.

The respondents who worked underground (M = 2.33) exhibited a higher level of agreement compared to those who worked underground and on the surface (M = 2.00; d = 0.51) that quid pro quo harassment is prevalent in the mine. The effect size showed a medium effect. These scores fall between “To some extent” and “To a moderate extent”. This suggests a perception of quid pro quo harassment being more prevalent among workers who exclusively work underground.

6.2.5 The association between the primary reason for selecting a career in mining and the working conditions of women employed in mining operations

Table 6.5 shows the results of the one-way ANOVA test for the primary reason for selecting a career in mining on the factors related to the working conditions of women employed in mining operations. The variable comprised four categories: unemployment, difficulty getting another job, job security and other.

Table 6. 5: Primary reason for selecting a career in mining and the working conditions of women employed in mining operations

Group statistics					ANOVA	Effect size		
Primary reason for selected mining career		N	Mean	*SD	P-value	A with	B with	C with
Development opportunities	A: Unemployment	95	2.94	1.01	0.159			
	B: Difficult to get another job	46	3.05	0.99		0.11		
	C: Job security	13	3.39	0.78		0.45	0.34	

Group statistics					ANOVA	Effect size		
Primary reason for selected mining career		N	Mean	*SD	P-value	A with	B with	C with
	*D: Other	29	3.36	1.11		0.37	0.27	0.03
	Total	183	3.07	1.01				
Workplace amenities for female miners	A: Unemployment	95	2.98	0.46	0.043			
	B: Difficult to get another job	46	2.80	0.40		0.39		
	C: Job security	13	3.20	0.50		0.44	0.79	
	*D: Other	29	2.84	0.76		0.17	0.06	0.47
	Total	183	2.93	0.52				
Childcare and breastfeeding facilities	A: Unemployment	94	1.15	0.49	0.220			
	B: Difficult to get another job	46	1.28	0.69		0.19		
	C: Job security	13	1.00	0.00		0.31	0.41	
	*D: Other	26	1.33	0.79		0.23	0.06	0.42
	Total	179	1.20	0.58				
Ablution facilities underground	A: Unemployment	95	2.37	0.47	0.221			
	B: Difficult to get another job	46	2.27	0.48		0.20		
	C: Job security	13	2.49	0.62		0.19	0.35	
	*D: Other	28	2.54	0.85		0.20	0.31	0.06
	Total	182	2.38	0.56				
Appointment practices	A: Unemployment	95	3.93	0.53	0.292			
	B: Difficult to get another job	46	3.96	0.55		0.05		
	C: Job security	13	4.14	0.31		0.40	0.33	
	*D: Other	29	3.79	0.67		0.20	0.24	0.52
	Total	183	3.93	0.55				
Women's physical capacity	A: Unemployment	95	4.23	0.62	0.084			
	B: Difficult to get another job	46	4.20	0.61		0.05		
	C: Job security	13	3.85	0.48		0.62	0.59	
	*D: Other	29	4.02	0.59		0.35	0.31	0.29
	Total	183	4.16	0.61				
Women's physical challenges	A: Unemployment	95	4.32	0.52	0.062			
	B: Difficult to get another job	46	4.19	0.63		0.22		

Group statistics					ANOVA	Effect size		
Primary reason for selected mining career		N	Mean	*SD	P-value	A with	B with	C with
	C: Job security	13	4.50	0.42		0.34	0.50	
	*D: Other	29	4.07	0.66		0.38	0.17	0.65
	Total	183	4.26	0.57				
Adequate health and safety measures	A: Unemployment	95	4.82	0.31	0.095			
	B: Difficult to get another job	46	4.75	0.39		0.16		
	C: Job security	13	4.66	0.58		0.26	0.15	
	*D: Other	29	4.56	0.90		0.28	0.21	0.11
	Total	183	4.75	0.49				
Gender-sensitive PPE	A: Unemployment	95	2.78	1.15	0.237			
	B: Difficult to get another job	46	2.62	0.94		0.14		
	C: Job security	13	3.28	1.12		0.43	0.59	
	*D: Other	29	2.97	1.29		0.14	0.27	0.24
	Total	183	2.81	1.13				
Work practices during motherhood	A: Unemployment	95	1.82	1.48	0.203			
	B: Difficult to get another job	46	2.11	1.65		0.17		
	C: Job security	13	2.46	1.85		0.35	0.19	
	*D: Other	29	2.45	1.78		0.35	0.19	0.01
	Total	183	2.04	1.61				
PPE fit	A: Unemployment	95	2.54	0.64	0.079			
	B: Difficult to get another job	46	2.50	0.73		0.06		
	C: Job security	13	2.66	0.83		0.14	0.20	
	*D: Other	29	2.91	0.91		0.40	0.46	0.27
	Total	183	2.60	0.73				
Conducive work environment	A: Unemployment	95	3.61	0.45	0.069			
	B: Difficult to get another job	46	3.49	0.59		0.21		
	C: Job security	13	3.89	0.28		0.63	0.69	
	*D: Other	29	3.47	0.77		0.18	0.02	0.55
	Total	183	3.58	0.55				
	A: Unemployment	95	3.27	0.57	0.184			

Group statistics					ANOVA	Effect size		
Primary reason for selected mining career		**N**	**Mean**	***SD**	**P-value**	**A with**	**B with**	**C with**
Inclusive workplace practices	B: Difficult to get another job	46	3.19	0.64		0.13		
	C: Job security	13	3.60	0.45		0.60	0.66	
	*D: Other	29	3.21	0.80		0.07	0.03	0.49
	Total	183	3.26	0.62				
Gender bias	A: Unemployment	95	2.23	0.60	0.032			
	B: Difficult to get another job	46	2.16	0.55		0.13		
	C: Job security	13	1.74	0.45		0.82	0.76	
	*D: Other	29	2.33	0.83		0.12	0.21	0.72
	Total	183	2.19	0.63				
Quid pro quo harassment (sexual favouritism)	A: Unemployment	65	2.49	0.66	0.126			
	B: Difficult to get another job	32	2.38	0.66		0.18		
	C: Job security	8	2.38	0.92		0.13	0.00	
	*D: Other	23	2.09	0.73		0.55	0.39	0.31
	Total	128	2.38	0.70				
Women's work at the mine and their personal lives	A: Unemployment	92	1.99	0.29	0.222			
	B: Difficult to get another job	46	1.97	0.35		0.04		
	C: Job security	13	1.98	0.15		0.02	0.02	
	*D: Other	28	2.13	0.54		0.27	0.30	0.28
	Total	179	2.01	0.35				

*SD: Standard deviation

*D: Other: Close to home/Bursary/Exciting work environment/Challenging industry/Ability to apply skills/ Competitive pay and benefits/Opportunities for advancement/International work opportunities

Cohen's d-values: small effect: d = 0.2; medium effect: d = 0.5; large effect: d = 0.8

The results of the ANOVA test revealed significant differences between the mean scores of amenities for female miners (p = 0.043) and gender bias (p = 0.032). The results are outlined below.

The respondents who selected unemployment as the main reason for becoming a mineworker (M = 2.98) had a marginally more favourable opinion of the mine's workplace amenities for female miners than respondents who did so due to difficulty in finding another job (M = 2.80; d = 0.39). However, they were less favourable than those who chose job security (M = 3.20;

d = 0.44). The effect sizes showed a small to medium effect. In addition, the respondents who selected job security (M = 3.20; d = 0.79) had more favourable opinions of the mine's workplace amenities for female miners than respondents who selected difficult to get another job (M = 2.80) and other (M = 2.84; d = 0.47) as the primary reasons for working at the mine. The effect sizes showed a medium to large effect.

Furthermore, the respondents who selected job security (M = 1.74) expressed a lower level of agreement regarding the occurrence of gender bias in the mine than those who selected unemployment (M = 2.23; d = 0.82), difficulty to get another job (M = 2.16; d = 0.76) or other reasons (M = 2.33; d = 0.72) as primary reason for their employment. The effect sizes further showed a medium to large effect. The results suggest that women who selected job security as primary reason for their employment at the mine seem to have a less favourable view of both the amenities provided for women and the occurrence of gender bias in the mine compared to those who entered mining due to other reasons.

6.2.6 Correlations between age, children, highest qualification, duration in mining and level of employment at the mine, and the working conditions of women employed in mining operations

Table 6.6 shows the results of Spearman's rank-order correlation coefficient between age, children, highest qualification, duration in mining, level of employment at the mine and the factors related to the working conditions of women employed in mining operations.

Table 6. 6: Correlations between age, children, highest qualification, duration in mining and level of employment at the mine, and the working conditions of women employed in mining operations

Factors		Age	Having children	Highest qualification	Duration in mining	Level of employment at the mine
Development opportunities	Correlation coefficient	0.00	0.02	-0.074	-.236**	0.074
	Sig. (2-tailed)	0.99	0.73	0.313	0.001	0.311
	N	196.00	196.00	190	196	192
Workplace amenities for female miners	Correlation coefficient	-0.01	0.05	-0.081	-0.100	0.010
	Sig. (2-tailed)	0.93	0.51	0.266	0.165	0.891
	N	196.00	196.00	190	196	192
Childcare and breastfeeding facilities	Correlation coefficient	-0.01	-0.05	0.008	0.075	-0.046
	Sig. (2-tailed)	0.84	0.46	0.912	0.300	0.534
	N	192.00	192.00	187	192	188
	Correlation coefficient	0.06	-0.03	-0.014	-0.063	-0.057

Factors		Age	Having children	Highest qualification	Duration in mining	Level of employment at the mine
Ablution facilities underground	Sig. (2-tailed)	0.42	0.68	0.851	0.385	0.437
	N	193.00	193.00	187	193	189
Appointment practices	Correlation coefficient	0.05	0.05	-0.054	-0.137	-0.004
	Sig. (2-tailed)	0.52	0.52	0.462	0.055	0.959
	N	196.00	196.00	190	196	192
Women's physical capacity	Correlation coefficient	-0.09	-0.08	0.014	0.065	-0.084
	Sig. (2-tailed)	0.19	0.24	0.852	0.365	0.244
	N	196.00	196.00	190	196	192
Women's physical challenges	Correlation coefficient	0.05	.154*	-.144*	-0.060	-0.066
	Sig. (2-tailed)	0.52	0.03	0.047	0.402	0.364
	N	196.00	196.00	190	196	192
Adequate health and safety measures	Correlation coefficient	0.07	-0.03	-.182*	0.034	-0.094
	Sig. (2-tailed)	0.33	0.71	0.012	0.634	0.193
	N	196.00	196.00	190	196	192
Gender-sensitive PPE	Correlation coefficient	0.11	0.04	-0.008	0.038	-0.117
	Sig. (2-tailed)	0.11	0.60	0.908	0.599	0.105
	N	196.00	196.00	190	196	192
Work practices during motherhood	Correlation coefficient	-0.03	-0.04	-0.121	-0.085	-0.050
	Sig. (2-tailed)	0.71	0.55	0.097	0.236	0.490
	N	196.00	196.00	190	196	192
PPE fit	Correlation coefficient	0.03	0.09	0.025	-0.039	-0.067
	Sig. (2-tailed)	0.67	0.22	0.730	0.592	0.357
	N	196.00	196.00	190	196	192
Conducive work environment	Correlation coefficient	0.04	0.10	-0.099	-0.103	-0.029
	Sig. (2-tailed)	0.56	0.17	0.175	0.150	0.691
	N	196.00	196.00	190	196	192
Inclusive workplace practices	Correlation coefficient	0.08	0.08	-0.102	-0.071	-0.038
	Sig. (2-tailed)	0.25	0.26	0.162	0.326	0.599
	N	196.00	196.00	190	196	192
Gender bias	Correlation coefficient	-0.07	0.00	-0.004	0.013	-0.060

Factors		Age	Having children	Highest qualification	Duration in mining	Level of employment at the mine
	Sig. (2-tailed)	0.35	1.00	0.957	0.860	0.411
	N	196.00	196.00	190	196	192
Quid pro quo harassment (sexual favouritism)	Correlation coefficient	-0.05	0.05	-0.118	0.035	-0.140
	Sig. (2-tailed)	0.55	0.54	0.177	0.687	0.106
	N	138.00	138.00	132	138	134
Women's work at the mine and their personal lives	Correlation coefficient	0.09	0.14	-0.119	0.121	0.005
	Sig. (2-tailed)	0.20	0.05	0.105	0.094	0.944
	N	192.00	192.00	186	192	188

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
(a) small effect: r = 0.1, (b) medium effect: r = 0.3 and (c) large effect: r > 0.5

The results of the Spearman's rank-order correlation coefficient are discussed below.

Table 6.6 revealed no significant correlations between age and level of employment at the mine and the factors related to the working conditions of women employed in mining operations.

A small positive correlation was found between having children and women's physical challenges (p = 0.03; r = 0.154), as well as between having children and women's work at the mine and their personal lives (p = 0.05; r = 0.14). These results suggest that women with children might experience heightened physical constraints, and their work at the mine might have a more pronounced effect on their personal lives such as increasing marital/partner conflict and influencing their childcare responsibilities, their community involvement, their relationship with their friends and family and their overall health and wellness.

A small negative correlation was observed between highest qualification and women's physical challenges (p = 0.047; r = -0.144), as well as between highest qualification and adequate health and safety measures (p = 0.012; r = -0.182). This suggests that the higher the qualifications of the women, the less they were of the opinion that women's work at the mine are physical challenging (e.g. labour-intensive work that results in fatigue, body pain, menstrual cycle issues and physiological strain caused by performing physically demanding tasks for an extended period) and the less they viewed the health and safety measures (e.g. training on equipment handling, PPE and HIV/AIDS mitigation) taken by the mining company as adequate.

A small negative correlation was detected between duration working in the mining industry and development opportunities ($p = 0.001$; $r = -0.236$), suggesting that as women spend more time in the mining industry, their outlook on development opportunities tends to become less positive, and vice versa.

The following section presents the results of Spearman's rank-order correlation coefficient and the factors related to the working conditions of women employed in mining operations.

6.2.7 Correlations between the factors of the working conditions of women employed in mining operations

Table 6.7 shows the results of Spearman's rank-order correlation coefficient between the factors of the working conditions of women employed in mining operations.

Table 6. 7: Correlations between the factors of the working conditions of women employed in mining operations

Factors		Development opportunities	Workplace amenities for female miners	Childcare and breastfeeding facilities	Ablution facilities underground	Appointment practices	Women's physical capacity	Women"s physical challenges	Adequate health and safety measures	Gender-sensitive PPE	Work practices during motherhood	PPE fit	Conducive work environment	Inclusive workplace practices	Gender bias	Quid pro quo harassment	Women's work at the mine and their personal lives
Development opportunities	Correlation coefficient	1.000	0.193**	0.235**	0.264**	0.107	-0.202**	0.309**	0.127	0.242**	0.383**	0.327**	0.528**	0.577**	-0.323**	-0.039	0.142
	Sig. (2-tailed)		0.007	0.001	0.000	0.134	0.005	0.000	0.076	0.001	0.000	0.000	0.000	0.000	0.000	0.652	0.050
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Workplace amenities for female miners	Correlation coefficient	0.193**	1.000	-0.002	0.441**	0.085	0.023	0.178*	0.147*	0.219**	0.001	0.216**	0.247**	0.345**	-0.217**	0.057	-0.026
	Sig. (2-tailed)	0.007		0.979	0.000	0.234	0.749	0.012	0.040	0.002	0.994	0.002	0.000	0.000	0.002	0.507	0.720
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Childcare and breastfeeding facilities	Correlation coefficient	0.235**	-0.002	1.000	-0.090	-0.443**	0.153*	-0.181*	-0.102	-0.072	0.339**	0.272**	-0.019	0.166*	-0.263**	0.098	0.190**
	Sig. (2-tailed)	0.001	0.979		0.217	0.000	0.034	0.012	0.160	0.320	0.000	0.000	0.797	0.022	0.000	0.257	0.009
	N	192	192	192	189	192	192	192	192	192	192	192	192	192	192	136	190
Ablution facilities underground	Correlation coefficient	0.264**	0.441**	-0.090	1.000	0.119	-0.127	0.300**	0.141*	.334**	0.093	0.253**	0.401**	0.433**	-0.208**	-0.009	-0.096
	Sig. (2-tailed)	0.000	0.000	0.217		0.100	0.079	0.000	0.050	0.000	0.201	0.000	0.000	0.000	0.004	0.918	0.187
	N	193	193	189	193	193	193	193	193	193	193	193	193	193	193	138	189
Appointment practices	Correlation coefficient	0.107	0.085	-0.443**	0.119	1.000	-0.194**	0.334**	0.204**	.163*	-0.237**	-0.127	0.267**	0.174*	0.074	-0.199*	0.015
	Sig. (2-tailed)	0.134	0.234	0.000	0.100		0.006	0.000	0.004	0.023	0.001	0.075	0.000	0.015	0.302	0.019	0.839
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192

Factors		Development opportunities	Workplace amenities for female miners	Childcare and breastfeeding facilities	Ablution facilities underground	Appointment practices	Women's physical capacity	Women"s physical challenges	Adequate health and safety measures	Gender-sensitive PPE	Work practices during motherhood	PPE fit	Conducive work environment	Inclusive workplace practices	Gender bias	Quid pro quo harassment	Women's work at the mine and their personal lives
Women's physical capacity	Correlation coefficient	-0.202**	0.023	0.153*	-0.127	-0.194**	1.000	-0.404**	0.014	-0.129	0.033	0.028	-0.447**	-0.261**	0.179*	0.142	-0.010
	Sig. (2-tailed)	0.005	0.749	0.034	0.079	0.006		0.000	0.848	0.071	0.650	0.701	0.000	0.000	0.012	0.098	0.889
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Women's physical challenges	Correlation coefficient	0.309**	0.178*	-0.181*	0.300**	0.334**	-0.404**	1.000	0.267**	0.167*	-0.133	0.050	0.668**	0.484**	-0.144*	-0.173*	0.050
	Sig. (2-tailed)	0.000	0.012	0.012	0.000	0.000	0.000		0.000	0.019	0.064	0.487	0.000	0.000	0.045	0.042	0.489
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Adequate health and safety measures	Correlation coefficient	0.127	0.147*	-0.102	0.141*	0.204**	0.014	0.267**	1.000	0.188**	0.033	-0.070	0.279**	0.220**	-0.047	0.095	0.109
	Sig. (2-tailed)	0.076	0.040	0.160	0.050	0.004	0.848	0.000		0.008	0.642	0.331	0.000	0.002	0.515	0.266	0.131
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Gender-sensitive PPE	Correlation coefficient	0.242**	0.219**	-0.072	0.334**	0.163*	-0.129	0.167*	0.188**	1.000	0.190**	0.340**	0.360**	0.352**	-0.102	-0.086	0.060
	Sig. (2-tailed)	0.001	0.002	0.320	0.000	0.023	0.071	0.019	0.008		0.008	0.000	0.000	0.000	0.155	0.317	0.405
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Work practices during motherhood	Correlation coefficient	0.383**	0.001	0.339**	0.093	-0.237**	0.033	-0.133	0.033	0.190**	1.000	0.351**	0.116	0.201**	-0.271**	0.167	0.107
	Sig. (2-tailed)	0.000	0.994	0.000	0.201	0.001	0.650	0.064	0.642	0.008		0.000	0.106	0.005	0.000	0.051	0.138
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
PPE fit	Correlation coefficient	0.327**	0.216**	0.272**	0.253**	-0.127	0.028	0.050	-0.070	0.340**	0.351**	1.000	0.166*	0.337**	-0.205**	0.080	0.009

Factors		Development opportunities	Workplace amenities for female miners	Childcare and breastfeeding facilities	Ablution facilities underground	Appointment practices	Women's physical capacity	Women"s physical challenges	Adequate health and safety measures	Gender-sensitive PPE	Work practices during motherhood	PPE fit	Conducive work environment	Inclusive workplace practices	Gender bias	Quid pro quo harassment	Women's work at the mine and their personal lives
	Sig. (2-tailed)	0.000	0.002	0.000	0.000	0.075	0.701	0.487	0.331	0.000	0.000		0.020	0.000	0.004	0.352	0.903
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Conducive work environment	Correlation coefficient	0.528**	0.247**	-0.019	0.401**	0.267**	-0.447**	0.668**	0.279**	0.360**	0.116	0.166*	1.000	0.689**	-0.335**	-0.063	-0.020
	Sig. (2-tailed)	0.000	0.000	0.797	0.000	0.000	0.000	0.000	0.000	0.000	0.106	0.020		0.000	0.000	0.463	0.786
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Inclusive workplace practices	Correlation coefficient	0.577**	0.345**	0.166*	0.433**	0.174*	-0.261**	0.484**	0.220**	0.352**	0.201**	0.337**	0.689**	1.000	-0.327**	-0.019	0.147*
	Sig. (2-tailed)	0.000	0.000	0.022	0.000	0.015	0.000	0.000	0.002	0.000	0.005	0.000	0.000		0.000	0.824	0.042
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Gender bias	Correlation coefficient	-0.323**	-0.217**	-0.263**	-0.208**	0.074	0.179*	-0.144*	-0.047	-0.102	-0.271**	-0.205**	-0.335**	-0.327**	1.000	0.098	0.026
	Sig. (2-tailed)	0.000	0.002	0.000	0.004	0.302	0.012	0.045	0.515	0.155	0.000	0.004	0.000	0.000		0.252	0.716
	N	196	196	192	193	196	196	196	196	196	196	196	196	196	196	138	192
Quid pro quo harassment	Correlation coefficient	-0.039	0.057	0.098	-0.009	-0.199*	0.142	-0.173*	0.095	-0.086	0.167	0.080	-0.063	-0.019	0.098	1.000	-0.066
	Sig. (2-tailed)	0.652	0.507	0.257	0.918	0.019	0.098	0.042	0.266	0.317	0.051	0.352	0.463	0.824	0.252		0.440
	N	138	138	136	138	138	138	138	138	138	138	138	138	138	138	138	138
Women's work at the mine and	Correlation coefficient	0.142	-0.026	0.190**	-0.096	0.015	-0.010	0.050	0.109	0.060	0.107	0.009	-0.020	0.147*	0.026	-0.066	1.000

Factors		Development opportunities	Workplace amenities for female miners	Childcare and breastfeeding facilities	Ablution facilities underground	Appointment practices	Women's physical capacity	Women"s physical challenges	Adequate health and safety measures	Gender-sensitive PPE	Work practices during motherhood	PPE fit	Conducive work environment	Inclusive workplace practices	Gender bias	Quid pro quo harassment	Women's work at the mine and their personal lives
their personal lives	Sig. (2-tailed)	0.050	0.720	0.009	0.187	0.839	0.889	0.489	0.131	0.405	0.138	0.903	0.786	0.042	0.716	0.440	
	N	192	192	190	189	192	192	192	192	192	192	192	192	192	192	138	192

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

(a) small effect: r = 0.1, (b) medium effect: r = 0.3 and (c) large effect: r > 0.5

The results of the Spearman's rank-order correlation coefficient are discussed below.

Development opportunities

Small to large positive correlations were observed between development opportunities and workplace amenities for female miners ($p = 0.007$; $r = 0.193$), childcare and breastfeeding facilities ($p = 0.001$; $r = 0.235$) and ablution facilities underground ($p = 0.000$; $r = 0.264$), suggesting that access to essential amenities such as adequate hand-washing facilities, sanitary bins, adequate lighting and gender-specific accommodations such as family units is linked to enhanced developmental prospects. Small to large positive correlations were found between development opportunities and gender-sensitive PPE ($p = 0.001$; $r = 0.242$), workplace practices during motherhood ($p = 0.000$; $r = 0.383$), PPE fit ($p = 0.000$; $r = 0.327$), conducive work environment ($p = 0.000$; $r = 0.528$), inclusive workplace practices ($p = 0.000$; $r = 0.577$) and women's work at the mine and their personal lives ($p = 0.050$; $r = 0.142$). The results suggest that the more positive views the respondents held regarding the development opportunities offered by the mine, the more satisfied they were with the PPE, their work environment and how their work at the mine influences their personal lives. A small positive correlation was also found between development opportunities and women's physical challenges ($p = 0.005$; $r = 0.309$), indicating that the more positive the respondents were about the development opportunities offered by the mine, the more they thought that women's work at the mine is physically challenging.

Conversely, small negative correlations were observed between development opportunities and women's physical capacity ($p = 0.005$; $r = -0.202$) and gender bias ($p = 0.000$; $r = -0.323$), suggesting that limitations in physical capacity and prevalent gender bias in the workplace environment (e.g. stereotypes, disrespectful treatment and underestimation by male co-workers) may impede women's developmental opportunities. These results emphasise the importance of addressing various working conditions and implementing supportive measures to promote women's professional growth and advancement in mining operations.

Infrastructure facilities

Small to medium positive correlations were observed between workplace amenities for female miners and development opportunities ($p = 0.007$; $r = 0.193$), ablution facilities underground ($p = 0.000$; $r = 0.441$), women's physical challenges ($p = 0.012$; $r = 0.178$), adequate health and safety measures ($p = 0.040$; $r = 0.147$), gender-sensitive PPE ($p = 0.002$; $r = 0.219$), PPE fit ($p = 0.002$; $r = 0.216$), conducive work environment ($p = 0.000$; $r = 0.247$) and inclusive workplace practices ($p = 0.000$; $r = 0.345$). The results suggest that the more positive the

respondents were regarding the facilities provided on the surface for women working in mining operations, the more they tended to be positive regarding various workplace conditions and practices at the mine, such as the provision of training and mentorship programmes, health and safety measures taken by the mining company to protect their employees, the provision of gender-sensitive PPE that ensures a proper fit, the conduciveness of the work environment to accommodate women and inclusive workplaces. The same trend was observed between the factor ablution facilities underground and the factors mentioned above; the correlations were positive and ranged between small and medium. Therefore, adequate facilities for women on the surface and underground are important, because they create a supportive and conducive work environment, enhancing employee satisfaction, productivity and well-being, as also suggested by Badenhorst (2009:61) and Botha (2017:18).

On the contrary, small negative correlations were observed between workplace amenities for female miners ($p = 0.002$; $r = -0.217$), ablution facilities underground ($p = 0.004$; $r = -0.208$) and gender bias, suggesting that as the quality or availability of workplace amenities for female miners and underground facilities improves, fewer gender bias occurs.

Small to medium positive correlations were also found between childcare and breastfeeding facilities and development opportunities ($p = 0.001$; $r = 0.235$), women's physical capacity ($p = 0.034$; $r = 0.153$), work practices during motherhood ($p = 0.000$; $r = 0.339$), PPE fit ($p = 0.000$; $r = 0.272$), inclusive workplace practices ($p = 0.022$; $r = 0.166$) and women's work at the mine and their personal lives ($p = 0.009$; $r = 0.190$). The results indicate that investments or efforts to improve childcare and breastfeeding facilities in the mining environment are associated with positive outcomes related to career development, workplace support for mothers, safety, inclusivity and work–life balance for women working in mining operations.

Small to medium negative correlations were found between childcare and breastfeeding facilities and appointment practices ($p = 0.000$; $r = -0.443$), women's physical challenges ($p = 0.012$; $r = -0.181$) and gender bias ($p = 0.000$; $r = -0.263$). The results indicate that improvements in childcare and breastfeeding facilities in the mining environment are associated with reduced negative views of appointment practices and the physical challenges and gender bias women experience at the mine.

Physical proficiency abilities

Small to medium positive correlations were observed between appointment practices and women's physical challenges ($p = 0.000$; $r = 0.334$), adequate health and safety measures ($p = 0.004$; $r = 0.204$), gender-sensitive PPE ($p = 0.023$; $r = 0.163$), conducive work environment ($p = 0.000$; $r = 0.267$) and inclusive workplace practices ($p = 0.015$; $r = 0.174$).

The results indicate that the more positive the perceptions of the respondents were regarding the appointment practices of the mine (e.g. women's physical strength and endurance being considered when they are appointed), the more they were aware of the physical challenges that women are subjected to at the mine and the more favourable attitudes they displayed towards the health and safety measures implemented by the mine to protect women, the provision of gender-sensitive PPE and the measures implemented by the mine to create a conducive work environment and inclusive workplace practices to accommodate women at the mine.

Conversely, small to medium negative correlations were found between appointment practices and childcare and breastfeeding facilities ($p = 0.000$; $r = -0.443$), women's physical capacity ($p = 0.006$; $r = -0.194$), work practices during motherhood ($p = 0.001$; $r = -0.237$) and quid pro quo harassment ($p = 0.019$; $r = -0.199$), suggesting that improvements in appointment practices at the mine may result in reduced negative views of childcare and breastfeeding facilities offered by the mine, the physical capacity of women to conduct mining tasks, challenges in work practices during motherhood and perceptions of quid pro quo harassment in the workplace.

Small positive correlations were observed between women's physical capacity and childcare and breastfeeding facilities ($p = 0.034$; $r = 0.153$) and gender bias ($p = 0.012$; $r = 0.179$). These results indicate that the more the respondents were aware of women's physical capacity to perform mining tasks, the more they were aware of the childcare and breastfeeding facilities offered at the mine and the gender bias they experience in the workplace.

On the other hand, small to medium negative correlations were found between women's physical capacity and development opportunities ($p = 0.005$; $r = -0.202$), appointment practices ($p = 0.006$; $r = -0.194$), women's physical challenges ($p = 0.000$; $r = -0.404$), conducive work environment ($p = 0.000$; $r = -0.447$) and inclusive workplace practices ($p = 0.000$; $r = -0.261$). These results suggest that the more the respondents thought that women have the physical capacity to perform mine work, the less negative views they had regarding the development opportunities offered by the mine, the appointment practices of the mine, the physical challenges experience when performing mine work, the conduciveness of the work environment and the inclusive workplace practices implemented to accommodate women at the mine. Improvements in addressing physical capacity-related challenges may create a more equitable and supportive work environment for women in the mining industry.

Small to large positive correlations were found between women's physical challenges and development opportunities ($p = 0.000$; $r = 0.309$), workplace amenities for female miners ($p = 0.012$; $r = 0.178$), ablution facilities underground ($p = 0.000$; $r = 0.300$), appointment practices

(p = 0.000; r = 0.334), adequate health and safety measures (p = 0.000; r = 0.267), gender-sensitive PPE (p = 0.019; r = 0.167), conducive work environment (p = 0.000; r = 0.668) and inclusive workplace practices (p = 0.000; r = 0.484). These results suggest that the more women encountered physical challenges in the workplace, the more they regarded various aspects of their work environment important, such as adequate development opportunities, suitable facilities on the surface and underground, proper appointment practices, satisfactory health and safety measures, the provision of gender-sensitive PPE, a conducive work environment and inclusive workplace practices. This underscores the importance of addressing women's physical challenges to create a supportive and inclusive work environment in which women working in mining operations can thrive.

Conversely, small to medium negative correlations were found between women's physical challenges and childcare and breastfeeding facilities (p = 0.012; r = -0.181), women's physical capacity (p = 0.000; r = -0.404), gender bias (p = 0.045; r = -0.144) and quid pro quo harassment (p = 0.042; r = -0.173). The results indicate that as women working in mining operations face more physical challenges at the mine, it may result in negative perceptions of various aspects of their work environment, including access to childcare and breastfeeding facilities, their physical capacity, gender bias experience and occurrence of quid pro quo harassment. This underscores the importance of addressing women's physical challenges, as indicated above.

Health and safety considerations

Small positive correlations were found between adequate health and safety measures and workplace amenities for female miners (p = 0.040; r = 0.147), ablution facilities underground (p = 0.050; r = 0.141), appointment practices (p = 0.004; r = 0.204), women's physical challenges (p = 0.000; r = 0.267), gender-sensitive PPE (p = 0.008; r = 0.188), conducive work environment (p = 0.000; r = 0.279) and inclusive workplace practices (p = 0.002; r = 0.220). These results suggest that improvements in health and safety measures in the mining environment are associated with positive perceptions of various aspects of the workplace environment, including the quality of facilities provided, appointment practices, physical challenges encountered, provision of gender-sensitive PPE, conduciveness of the work environment and inclusive workplace practices implemented.

Small to medium positive correlations were observed between gender-sensitive PPE and development opportunities (p = 0.001; r = 0.242), workplace amenities for female miners (p = 0.002; r = 0.219), ablution facilities underground (p = 0.000; r = 0.334), appointment practices (p = 0.023; r = 0.163), women's physical challenges (p = 0.019; r = 0.167), adequate health and safety measures (p = 0.008; r = 0.188), work practices during motherhood

(p = 0.008; r = 0.190), PPE fit (p = 0.000; r = 0.340), conducive work environment (p = 0.000; r = 0.360) and inclusive workplace practices (p = 0.000; r = 0.352). The results indicate that improvements in gender-sensitive PPE in the mining environment may result in positive views of various aspects of the workplace environment, including development opportunities offered, the quality of facilities provided, appointment practices, physical challenges encountered, health and safety measures implemented, work practices during motherhood, PPE fit, conduciveness of the work environment and inclusive workplace practices implemented.

Small and medium positive correlations were found between work practices during motherhood and development opportunities (p = 0.000; r = 0.383), childcare and breastfeeding facilities (p = 0.000; r = 0.339), gender-sensitive PPE (p = 0.008; r = 0.190), PPE fit (p = 0.000; r = 0.351) and inclusive workplace practices (p = 0.005; r = 0.201). These results suggest that supportive work practices during motherhood, such as the provision of alternative employment for women during early motherhood and breastfeeding, may result in positive views of development opportunities offered, access to childcare and breastfeeding facilities and gender-sensitive PPE, PPE fit and inclusive workplace practices implemented. This highlights the importance of creating a supportive work environment for employees who balance work and motherhood responsibilities.

On the contrary, small negative correlations were observed between work practices during motherhood and appointment practices (p = 0.001; r = -0.237) and gender bias (p = 0.000; r = -0.271). These results imply that enhancements in supporting working mothers in the workplace may result in reduced negative views of appointment practices and the gender bias encountered in the workplace, such as the consideration of women's size and body when allocating them to positions and labour-intensive work affecting women's bodies and their menstrual cycle.

Small and medium positive correlations were found between PPE fit and development opportunities (p = 0.000; r = 0.327), workplace amenities for female miners (p = 0.002; r = 0.216), childcare and breastfeeding facilities (p = 0.000; r = 0.272), ablution facilities underground (p = 0.000; r = 0.253), gender-sensitive PPE (p = 0.000; r = 0.340), work practices during motherhood (p = 0.000; r = 0.351), conducive work environment (p = 0.020; r = 0.166) and inclusive workplace practices (p = 0.000; r = 0.337). These results highlight the importance of PPE that fit women comfortably, as it may result in positive perceptions of the work environment, including development opportunities available for women, facility quality, gender sensitivity, work practices during motherhood and overall workplace inclusivity. These results suggest that ensuring proper PPE fitment is crucial for safety and promoting a supportive work environment, gender inclusivity and overall workplace well-being.

Conversely, small negative correlations were observed between PPE fit and gender bias (p = 0.004; r = -0.205), suggesting that employees who perceive their PPE to be better fitted tend to experience fewer gender bias. In other words, there is an indication that properly fitting PPE may contribute to reducing obstacles or difficulties faced by workers in their daily tasks or work environment.

Workplace practices

Small to large positive correlations were found between conducive work environment and development opportunities (p = 0.000; r = 0.528), workplace amenities for female miners (p = 0.000; r = 0.247), ablution facilities underground (p = 0.000; r = 0.401), appointment practices (p = 0.000; r = 0.267), women's physical challenges (p = 0.000; r = 0.668), adequate health and safety measures (p = 0.000; r = 0.279), gender-sensitive PPE (p = 0.00; r = 0.360), PPE fit (p = 0.020; r = 0.166) and inclusive workplace practices (p = 0.000; r = 0.689). The results suggest that when the work environment is regarded supportive and favourable, women tend to display favourably attitudes towards other critical factors such as career advancement opportunities, facility quality, safety measures and inclusivity in the workplace.

Conversely, medium negative correlations were observed between conducive work environment and women's physical capacity (p = 0.000; r = -0.447) and gender bias (p = 0.000; r = -0.335), indicating that as the overall work environment becomes more supportive and accommodating, the assessment of women's physical capacity and gender bias tends to become less negative.

Small to large positive correlations were found between inclusive workplace practices and development opportunities (p = 0.000; r = 0.577), workplace amenities for female miners (p = 0.000; r = 0.345), childcare and breastfeeding (p = 0.022; r = 0.166), ablution facilities underground (p = 0.000; r = 0.433), appointment practices (p = 0.015; r = 0.174), women's physical challenges (p = 0.000; r = 0.484), adequate health and safety measures (p = 0.002; r = 0.220), gender-sensitive PPE (p = 0.000; r = 0.352), work practices during motherhood (p = 0.005; r = 0.201), PPE fit (p = 0.000; r = 0.337), conducive work environment (p = 0.000; r = 0.689) and women's work at the mine and their personal lives (p = 0.042; r = 0.147). These results suggest that women who experience the workplace to have inclusive practices, such as fair and equal treatment of women, tend to experience more opportunities for development, better facilities, improved safety measures and greater support for women in various aspects of their work and personal lives.

Conversely, small and medium negative correlations were observed between inclusive workplace practices and women's physical capacity (p = 0.000; r = -0.261) and gender bias (p = 0.000; r = -0.327), suggesting that the more the respondents regarded the work practices

at the mine as inclusive, the less they perceived women's physical capacity as a problem and the less they thought women were subjected to gender bias.

A small positive correlation was found between gender bias and women's physical capacity ($p = 0.012$; $r = 0.179$), indicating that awareness regarding women's physical capacity (e.g. women's capability to operate heavy and/or vibrating power tools such as the rock drill and their ability to operate other machinery such as the winch and locomotive) is associated with awareness regarding gender bias in the workplace (e.g. labour-intensive work being tough on women's bodies and their menstrual cycle).

On the other hand, small and medium negative correlations were found between gender bias and development opportunities ($p = 0.000$; $r = -0.323$), workplace amenities for female miners ($p = 0.002$; $r = -0.217$), childcare and breastfeeding facilities ($p = 0.000$; $r = -0.263$), ablution facilities underground ($p = 0.004$; $r = -0.208$), women's physical challenges ($p = 0.045$; $r = -0.144$), work practice during motherhood ($p = 0.000$; $r = -0.271$), PPE fit ($p = 0.004$; $r = -0.205$), conducive work environment ($p = 0.000$; $r = -0.335$) and inclusive workplace practices ($p = 0.000$; $r = -0.327$). These results suggest that as gender bias increase, there tend to be unfavourably views of the availability of development opportunities, the quality of facilities, support for mothers in the workplace and overall positive workplace practices.

Furthermore, small negative correlations were observed between quid pro quo harassment and appointment practices ($p = 0.019$; $r = -0.199$) and women's physical challenges ($p = 0.042$; $r = -0.173$), indicating that as perceptions of the occurrence of quid pro quo harassment increase, the tendency of unfavourable views of appointment practices and the physical challenges encountered by women in the workplace increase.

Personal

Small positive correlations were found between women's work at the mine and their personal lives and development opportunities ($p = 0.050$; $r = 0.142$), childcare and breastfeeding facilities ($p = 0.009$; $r = 0.190$) and inclusive workplace practices ($p = 0.042$; $r = 0.147$), suggesting that the more the respondents' personal lives intersected with their work at the mine, the more they were interested in development opportunities, childcare and breastfeeding facilities and inclusive workplace practices (e.g. specialised on-the-job training, mentorship programmes, decent childcare facilities and adequate breastfeeding facilities for women, and women being accepted by their male co-workers and being treated fairly and equally).

6.3 CHALLENGES AND CONCERNS OF WOMEN EMPLOYED IN MINING OPERATIONS

In the next section exploring open-ended questions, the respondents were allowed to articulate the main challenges women employed in mining operations (e.g. mining, metallurgy and engineering) encounter in the mining industry. Moreover, the respondents were encouraged to express any additional concerns they encountered while working in the mining industry. The results are discussed below.

The respondents listed several primary challenges women encounter in mining operations, including disrespectful and undermining behaviour exhibited by male counterparts, limited career development prospects and the need for personalised PPE. Despite recommendations for more proactive measures to improve women's working conditions and career growth, the WIM Committee has not fully realised its potential at the mine. The necessity of mentorship programmes, childcare facilities and bursaries for workers' dependants was emphasised. Other challenges were highlighted, such as uncomfortable PPE, inadequate changing facilities and a lack of clear communication regarding career development and training opportunities. The recurring theme of women's advancement underscores the imperative for better working conditions, opportunities for growth and a determined commitment to combat discrimination.

In addition to the challenges mentioned above, concerns were raised regarding the prospects for women to advance in their careers and the need for specialised training programmes, casting doubt on the efficacy of the WIM Committee. Respondents also advocated for improvements in changing rooms and the development of PPE tailored specifically for women. They emphasised the necessity for more gear designed to meet their unique requirements. Alongside calls for increased opportunities for growth and advancement and support for employees' children's education, there was a demand for transparent communication regarding training sessions. They emphasised that proactive measures are essential to address gender-specific issues and foster an inclusive and supportive work environment. Subsequently, the next section discusses and interprets the research results concerning the literature reviewed in chapters Two, Three and Four.

6.4 DISCUSSION AND INTERPRETATION OF THE RESULTS

This study aimed to explore the working conditions of women employed in mining operations at a platinum mine in South Africa. Chapter Five presented an overview of the study's research methodology and how it was implemented and operationalised. It further presented and discussed the biographical information of the respondents, as well as the descriptive statistics, reliability and validity of the variables used in the study. In this chapter, in the sections above,

the results of the inferential statistics (t-tests, ANOVAs and Spearman's rank-order correlation coefficient) were presented and discussed to understand the relationship between various socio-demographic variables on the factors related to working conditions.

The following section presents an interpretation of the study's empirical results in general and with specific reference to the literature review findings.

6.4.1 Biographical information

The study's respondents came from a platinum mine in the North-West province; there were 196 respondents, and all the women worked in mining operations there. This was expected, given that the study's target group was women in mining operations, mainly working underground and on the surface. The majority of the respondents were aged between 30 and 39, identified as black African, were married/remarried and had two or more children. Furthermore, the majority of the respondents reported having completed high (secondary) school, worked underground, were not required to work night shifts and had been working in the mining environment for 11 to 20 years as semi-skilled workers. In addition, the three primary reasons for selecting a career in mining were unemployment, difficulty in obtaining another job and job security. Lastly, the majority of the respondents indicated that they were not part of any committees in their company, such as the WIM Forum, Transformation Committee, Gender Equity Committee, Health and Safety Committee or Skills Development Committee.

6.4.2 Company benefits

In this study, company benefits in the context of mining refer to the advantages and rewards that mining companies offer to their employees, such as medical aid, housing and performance bonuses. To establish the company benefits provided to women employed in mining operations at the mine, a dichotomous scale consisting of 'yes' and 'no' response categories was used.

The study's results on company benefits, as reflected in the respondents' favourable replies, indicate significant acknowledgement of the benefits provided by the mining company. The high percentage of positive responses to benefits such as performance bonuses, housing, medical aid, training opportunities, maternity benefits, alternative employment for pregnant women, pension plans, life insurance and dental care suggests that the company implemented a comprehensive benefits package. This aligns with the predominant structure of employee benefits offered in the South African mining industry (CA Global HR, 2021).

Table 5.2 showed that the majority of the respondents expressed satisfaction with the range of benefits offered, with exceptionally high approval ratings for medical aid (95.8%), alternative employment for pregnant women (96.8%) and housing (92.6%). These benefits are essential for a supportive work environment that caters to employees' well-being. Providing performance bonuses (88%) and training opportunities (78.2%) also reflects the company's commitment to recognising employee performance and investing in professional development. However, this study also revealed areas for improvement. The majority of the respondents indicated a lack of satisfaction with benefits such as travelling/transport allowance, cell phone allowance, shift allowance, remoteness leave, bursary and scholarship programmes, and childcare facilities. These results suggest that, while the company has successfully implemented several vital benefits, gaps must be addressed to enhance employee satisfaction.

The results of this study are consistent with a study conducted by the Minerals Council South Africa (2020), which found that mining companies are implementing policies and initiatives to benefit and protect women, such as providing alternative maternity care options and installing workplace modifications, including restrooms and changing rooms to accommodate women. Furthermore, the study's results are consistent with that of the Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (2023), which found that mining companies offer women career growth and development opportunities. In addition, the results are consistent with Mashaba's (2022:239) research, which found that providing career advancement opportunities and an attractive remuneration package were among the company benefits offered to women in mining operations, specifically those employed in technical positions at the mines. Other studies further support this finding that the mining industry offers numerous attractive remuneration packages, including overtime pay, bonuses, anniversary allowances, options, profit sharing, share purchase plans, subsidised rent, cash-in leave, extra superannuation for employment services, living away from home allowances, contract completion bonuses and car leasing (Mashaba, 2022:107; Mashaba & Botha, 2023:3; Nyabeze *et al*., 2010:3).

The study's results on company benefits must be interpreted in the context of the statutory and regulatory frameworks that govern the South African mining industry's labour workforce, including women (see Chapter Four). The legislative framework plays a crucial role in shaping working conditions and benefits available to employees in the mining industry. The exceptionally high scores attained for medical aid, alternative employment for pregnant women and housing demonstrate the mining company's steadfast commitment to addressing critical welfare requirements in accordance with the principles advocated by the MHSA (RSA,

1996b). This Act emphasises the importance of providing safe and healthy working conditions, directly correlating with comprehensive benefit packages that prioritise employees' health and safety. The Act also requires comprehensive training programmes to equip workers with the essential safety skills to foster career advancement.

Moreover, by promoting safe living conditions through housing and medical aid, the Act directly influences employee health, especially for women facing unique challenges (RSA, 1996b). In addition, maternity benefits and provisions for alternative employment for pregnant workers reflect the Act's commitment to protecting vulnerable groups. Therefore, the Act mandates safety compliance and enhances the overall benefits package, supporting a diverse and inclusive workforce (RSA, 1996b). The EEA 55 of 1998 and the BCEA 75 of 1997 create a framework that mandates equitable treatment and minimum standards for employee benefits, such as working hours and leave benefits in the mining industry, and encourages mining companies to foster a more inclusive and supportive workplace. These Acts are essential for promoting the welfare and development of all employees, particularly those from previously disadvantaged backgrounds (RSA, 1997, 1998b).

The positive responses regarding the provision of company benefits, such as medical aid (95.8%), housing (92.6%) and maternity benefits (91.1%), indicate progress in addressing structural barriers for women, aligning with feminist theory, particularly third-wave feminism. This wave, which recognises the complexity of gender and its intersections with race, class and other factors, advocates inclusive workplace policies that address women's specific needs, as evidenced by benefits such as maternity leave and alternative employment for pregnant women (Drucker, 2018).

However, the negative responses regarding benefits, such as day childcare (96.4%) and day shifts for women with babies (82.2%), suggest persistent gaps that reflect the ongoing challenges in balancing work and caregiving responsibilities. This aligns with critiques in feminist organisational theory, particularly the argument that work–family issues are often categorised as 'women's problems', rather than being addressed through systemic organisational change (Peterson, 2019:3). Ely and Meyerson (2000b) argue that without cultural shifts that redefine how work is structured, the provision of certain benefits alone may be insufficient to dismantle deep-rooted gender inequities.

From a feminist theoretical perspective, particularly the third-wave and Marxist feminism, it is apparent that true equity extends beyond providing benefits that meet women's immediate needs. Marxist feminism, which focuses on the exploitation of women through capitalist structures, critiques the lack of benefits, such as childcare, as a perpetuation of the gendered

division of labour, where caregiving is perceived as a woman's responsibility (Tong, 2007:23–39). This reinforces the argument that without addressing the systemic nature of inequality, certain benefits may inadvertently perpetuate traditional gender roles (Peterson, 2019:3).

Moreover, Ely and Meyerson's (2000b:126-129) assess and revise the work culture frame proposes a more comprehensive approach, where the focus shifts from individual policies to re-examining and modifying the underlying social practices in companies. This frame aligns with third-wave feminist thought, emphasising the necessity to disrupt entrenched gendered practices in the workplace. Without such deeper cultural and structural shifts, even well-intended benefits may prove insufficient in achieving substantial progress towards gender equity (Ely & Meyerson, 2000b:126–129).

In conclusion, while providing benefits such as maternity leave and medical aid represents a positive step towards addressing gender-specific challenges, the absence of key support structures, such as childcare, underscores the need for a more comprehensive, feminist approach to organisational change. Feminist theory, particularly third-wave and Marxist feminism, advocates for comprehensive reforms that address women's immediate needs and challenges and revise the gendered norms that perpetuate inequality in the workplace (Ritzer, 2008:472). The results also emphasise the importance of a comprehensive benefits package that meets legislative requirements and aligns with the theoretical frameworks advocating for gender equity and organisational change. Mining companies can foster a more inclusive, supportive and satisfied workforce by addressing identified gaps and implementing structural changes. Integrating insights from feminist theory can further enhance efforts to create equitable and inclusive work environments.

6.4.3 Company policies

In this study, company policies in the mining industry refer to the guidelines, rules and procedures established by mining companies to govern their operations, ensure compliance with laws and regulations, promote workplace safety and uphold ethical standards. To establish the gender-sensitive policies provided by the mine, a dichotomous scale consisting of 'yes' and 'no' response categories was used.

The study's results reveal a significant awareness among women employed in mining operations of gender-sensitive policies in the mining company. As shown in Table 5.3, all the respondents (100%) were aware of employment equity and sexual harassment policies. Furthermore, there was high awareness of the skills development policy (90.8%), maternity policy (98%), gender-based health and safety policy (93.3%) and various leave policies

(99.5%). This awareness is crucial, as it reflects the extent to which a company's efforts to implement such policies are recognised by its workforce.

The unanimous awareness of employment equity and sexual harassment policies among respondents underscores the mining company's commitment to addressing gender issues and fostering an equitable work environment. The high level of awareness of other policies, such as skills development, maternity, gender-based health and safety, and leave policies, further indicates the comprehensive steps taken by the company to integrate gender sensitivity into its policy framework.

The results of this study regarding the substantial awareness of gender-sensitive policies among women in mining operations elucidate critical aspects of compliance with the legislative frameworks established by the MHSA and the MPRDA (see Chapter Four). The MHSA mandates employers to establish a safe working environment and implement measures to prevent health and safety hazards, specifically to address discrimination and harassment (RSA, 1996b). The MPRDA aims to promote equitable access to mineral resources and ensure that HDSAs, including women, benefit from mining activities (RSA, 2002b). The high level of awareness of these policies among employees indicates possible compliance with these legislative frameworks, suggesting that the company is proactive in aligning its policies with legal standards and effectively communicating them to employees, thereby promoting compliance and employee welfare.

The implementation of gender-sensitive policies in the mining company sector, such as employment equity, skills development, maternity leave, sexual harassment prevention, gender-based health and safety, and various leave provisions, can be analysed through the lens of different feminist theories. These policies aim to address gender inequality in a male-dominated industry such as mining, but their impact and alignment with feminist thought reveal both strengths and limitations.

Employment equity policies aim to create equal opportunities for women, aligning with liberal feminism, which advocates for legal and policy reforms in existing institutions to address gender inequality (Ritzer, 2008:463). This reflects Ely and Meyerson's (2000b:113) create equal opportunities frame, focusing on structural barriers such as biased hiring and promotion practices. However, feminist critiques argue that such policies often fail to disrupt deeper organisational cultures that favour male dominance, particularly in leadership roles. Liberal feminists emphasise the importance of policies such as affirmative action, but also recognise the limitations when these policies do not fully address ingrained power structures (Ely & Meyerson, 2000b:113; Kanter, 1987:37–53).

Skills development policies reflect the fix the women approach, rooted in liberal feminism but critiqued for its individualistic focus (Ely & Meyerson, 2000b:105; Kolb *et al*., 1998:10). This approach suggests that women's underrepresentation in industries such as mining is due to skill deficits, rather than addressing the systemic and cultural barriers that hinder their success (Ely & Meyerson, 2000b:106–107). While such initiatives provide women with the necessary tools to succeed in male-dominated fields, they risk reinforcing the notion that women must adapt to male-defined standards of success, leaving organisational structures intact. Feminists argue that true gender equity requires systemic change and not merely individual empowerment (Peterson, 2019:3).

Policies related to maternity leave and family responsibility leave resonate with socialist feminism. These policies acknowledge the unequal distribution of caregiving responsibilities between men and women and attempt to provide support for women to balance work and family life. Socialist feminists critique the failure of capitalism to value reproductive labour and advocate for policies that protect women's dual roles as workers and caregivers (Benschop & Verloo, 2015:103; Ritzer, 2008:472). However, feminist theorists also posit that these policies can reinforce the notion that balancing work and family is primarily a women's issue, without challenging the workplace structures perpetuating this imbalance. This reflects a common critique in radical feminism, which argues that patriarchal norms that undervalue caregiving should be dismantled to achieve true equity (Haralambos & Holborn, 2008:101).

Sexual harassment policies align with radical feminism, which seeks to challenge and dismantle patriarchal structures that perpetuate gendered violence and power imbalances (Haralambos & Holborn, 2008:101). In male-dominated industries, such as mining, where masculine norms often prevail, such policies are crucial to creating safer work environments for women. Radical feminists argue that addressing issues such as sexual harassment is a critical step toward dismantling the patriarchal power dynamics that marginalise women and allow harassment to persist (Haralambos & Holborn, 2008:101). However, the efficacy of such policies depends on their enforcement and whether they lead to broader cultural changes in the company.

Gender-based health and safety policies are essential in the mining industry, where physical demands and workplace risks affect women disproportionately. These policies can be linked to intersectional feminism, which emphasises the importance of addressing the diverse experiences of women, particularly those shaped by intersections of race, class and gender (Brewer, 1989:57; Lorber, 2010:197). Intersectional feminists critique one-size-fits-all approaches to gender-sensitive policies and advocate for more nuanced strategies that account for women's specific risks and challenges in different contexts. These policies reflect

attempts to meet the health and safety needs of women. However, feminist theory emphasises the importance of tailoring these measures to the diverse experiences of women in the sector.

In summary, the gender-sensitive policies implemented in the mining industry reflect concerns of liberal, socialist, radical and intersectional feminism, but their effectiveness varies. While employment equity and skills development empower women and promote formal equality, they often fail to address the more profound, systemic inequalities embedded in organisational cultures. The transformative potential of these policies lies in their ability to challenge and reshape the patriarchal norms that underlie gender-based discrimination in industries such as mining. Without such cultural shifts, these policies may only offer partial solutions to women's complex workplace issues.

6.4.4 Development opportunities

In this study, development opportunities in the mining context refer to programmes and support systems aimed at promoting women's professional growth. These include career development plans, mentorship, financial support, specialised training, flexible training access, networking events and leadership programmes to enhance women's career advancement. To establish the perceived development opportunities offered by the mining company and the study assistance schemes available to women employed in mining operations, a five-point and a three-point Likert scale was used.

The exploratory factor analysis underscored the reliability and internal consistency of the development opportunities construct, with a single factor explaining a substantial portion of the total variance.

The factor mean score indicated that the mining company sometimes provides development opportunities, albeit with potential for enhancement, particularly regarding financial support and awareness of study assistance schemes. This suggests that while the mining company offers certain development opportunities, there is considerable scope for improvement, specifically in the areas of financial support and awareness of study assistance schemes.

The ANOVA test results (section 6.2.3) showed significant differences in the mean scores for development opportunities across different marital statuses. The effect sizes indicated that the respondents who were single and not in a relationship perceived the development opportunities in the mining company more favourably compared to women with other relationship statuses. Furthermore, the correlation tests revealed that the respondents demonstrated a higher degree of optimism regarding the developmental opportunities provided by the company when they were satisfied with the available surface and underground

infrastructure, the provision of PPE and the organisational workplace practices. Conversely, the respondents exhibited reduced optimism about these opportunities when they encountered biases related to women's physical capacity and gender.

The results of this study align with the results of previous studies conducted by Botha (2013:280–286), Mangaroo-Pillay (2018) and Mashaba (2022), emphasising the necessity for substantial improvements in women's development opportunities in the mining industry. Although such opportunities are occasionally provided, there remains considerable scope for enhancement. Botha (2016:280–286) reported that women mineworkers perceived skills and career development opportunities as favouring men. This hinders their career growth and perpetuates gender disparities in the workplace. Botha (2016) also observed that some mining companies had implemented mentorship and skills development initiatives for women, suggesting that certain companies might be more proactive than others. Mangaroo-Pillay (2018:72–73) found that the majority of women respondents concurred that additional development and training are crucial for women in mining. Mashaba (2022:167) underscores the significance of career growth opportunities for retaining women in technical mining roles. Mashaba (2022:4) further emphasises that limited advancement opportunities lead to women leaving the industry.

As outlined in Chapter Four, South African legislation mandates equal opportunities and support for women in the workplace. The research results underscore the necessity for mining companies to ensure that their practices align with legislative and regulatory frameworks, including the EEA, PEPUDA, MHSA and the Mining Charter. The EEA requires employers to implement affirmative action measures, such as providing training programmes to promote equity for historically disadvantaged groups (RSA, 1998b). PEPUDA advocates for equitable access to opportunities, including training, and encourages companies to implement initiatives that empower marginalised groups (RSA, 2000). The MHSA stipulates that employers must provide training related to health and safety practices in mining, ensuring that workers are educated on safety protocol compliance, which is a crucial aspect of workplace training (RSA, 1996b). The Mining Charter explicitly addresses skills development, requiring mining companies to establish and implement training initiatives for HDSAs. The Charter is one of the most explicit in promoting training and development in the mining industry (RSA, 2004, 2010a, 2018). Although specific legislative requirements are met, a significant need remains to foster a supportive work environment, crucial for women's advancement in male-dominated sectors such as mining. Enhancing educational support, improving mentorship and financial assistance, fostering a supportive work environment and addressing systemic barriers are essential for gender equity and organisational change (Mashaba & Botha, 2023).

The results of this study regarding development opportunities and study assistance schemes in the mining industry can be effectively analysed through the lenses of liberal and intersectional feminism. Liberal feminism advocates for equal opportunities within existing structures, emphasising the need for policy changes that promote gender equity (Ritzer, 2008:463). This perspective is reflected in the respondents' acknowledgement of available on-the-job training and sponsored courses, indicating an organisational attempt to create equal opportunities. However, the absence of comprehensive financial support, such as study loans and bursaries, highlights a significant shortfall in achieving true equity. Ely and Meyerson's (2000b) create equal opportunities framework embodies this approach, critiquing the limited impact of such initiatives on organisational culture and revealing that the mere implementation of programmes is insufficient without addressing deeper systemic issues.

In contrast, black and intersectional feminism provides a nuanced understanding of how various intersecting identities, including racial background and socioeconomic status, influence women's workplace experiences (Lorber, 2010:197). This perspective is particularly pertinent in the South African mining industry, where historical and systemic inequities are pervasive. The research results indicate a lack of awareness regarding existing bursaries and tertiary education opportunities, suggesting that current formal policies may inadequately address the diverse needs of all female employees within the company. Acker's (1990) analysis of gendered organisational structures further elucidates how these practices can perpetuate inequalities by neglecting the specific developmental requirements of disadvantaged groups, thereby reinforcing existing power structures.

Furthermore, feminist theory's critique of the fix the women approach underscores the necessity for comprehensive systemic changes rather than solely focusing on individual interventions (Ely & Meyerson, 2000b; Peterson, 2019; Williamson & Colley, 2018). This perspective explains why companies might offer training programmes but fail to implement holistic support systems that assist women in overcoming advancement obstacles. By acknowledging and addressing these broader systemic issues, mining companies can develop more inclusive strategies that empower women (Meyerson & Kolb, 2000:561; Peterson, 2019:3). The incorporation of both liberal and intersectional feminist viewpoints not only enhances comprehension of gender equity in the mining industry, but also guides companies aiming to implement meaningful changes, thereby promoting a more equitable future for all workers (Lorber, 2010:4).

6.4.5 Infrastructure facilities

In this study, infrastructure facilities in the mining context refer to foundational and support systems that enable efficient and safe operation of mining activities. These encompass a

variety of physical structures, including ablution facilities, accommodation, transportation and changing facilities.

Two five-point and two three-point Likert scales were utilised to assess the perceived provision of infrastructure facilities on the surface and underground, and housing and childcare facilities for women employed in mining operations by the mining company.

A five-point Likert scale was employed to assess the infrastructure on the surface and underground provided by the mining company. The exploratory factor analysis yielded three factors: workplace amenities for female miners, childcare and breastfeeding facilities, and ablution facilities underground. The factors exhibited high reliability and internal consistency, as evidenced by Cronbach's alpha coefficients. A three-point Likert scale comprising the categories Yes (1), No (2) and Don't know (3) was used to assess the housing and childcare facilities provided by the mining company to female miners; the scale was not subjected to a factor analysis.

The mean score for the workplace amenities for female miners factor was 2.918, indicating that respondents moderately concurred with the adequacy of surface infrastructure for women in mining operations, including gender-segregated toilets, hygienic facilities, changing rooms with sufficient handwashing amenities, sanitary waste disposal units and appropriate illumination near the workplace. The factor mean score for ablution facilities underground was 2.363, indicating that the mine, to some extent, provides underground ablution facilities for women in mining operations. However, the childcare and breastfeeding facilities factor obtained a mean score of 1.211, suggesting that, according to respondents, the mining company did not provide childcare and breastfeeding facilities. The data (see Chapter Five, Table 5.17) also suggests that the company has implemented a range of housing solutions (family units and men's hostels, ownership options and a living-out allowance) to accommodate its female workforce, albeit with a noticeable lack of dedicated women's hostels. Furthermore, the data (see Chapter Five, Table 5.18) highlights a significant gap in childcare support; this reflects a limitation in the company's support infrastructure for women, which could be crucial for retaining female employees and promoting gender inclusivity in the workforce.

The ANOVA test results (section 6.2.5) indicated that individuals who selected job security as their primary motivation for pursuing a mining career perceived workplace amenities for female miners more favourably than those who cited unemployment, difficulty finding other jobs or other. The results of the correlations tests (section 6.2.7) suggest that when women feel supported by amenities designed for their needs (i.e. gender-sensitive facilities on the surface

and underground), they are more likely to also view other aspects of the workplace favourably (e.g. development opportunities, health and safety measures, PPE and workplace practices). The results further suggest that enhancements in amenities and facilities for female miners are associated with a decrease in adverse perceptions of gender bias, such as disrespectful behaviour by male colleagues and social isolation

The research results align with those of Abrahamsson *et al.* (2014), Badenhorst (2009), Benya (2009), Botha (2013) and Mangaroo-Pillay (2018). Botha (2013:299–309) highlights issues concerning insufficient lavatory facilities, changing areas and PPE for women working in core mining positions on the surface and underground, particularly noting the absence of dedicated changing rooms and underground sanitary amenities for women. This inadequate infrastructure impedes women's full participation in primary mining roles (Badenhorst, 2009:61; Botha, 2013:300–309). The absence of underground lavatory facilities for female miners, particularly the need to share toilets with men, presents unique challenges, especially during menstruation (Abrahamsson *et al*., 2014; Benya, 2009). Benya (2009:125–131) also reported a lack of childcare provisions, necessitating women miners to send their children to grandparents due to extended working hours. Mangaroo-Pillay (2018:71–72) found underground amenities problematic, while surface toilet facilities were generally deemed appropriate for women.

The research results underscore the imperative for mining companies to ensure that their practices align with legislative and regulatory frameworks, including the MHSA and the Mining Charter. According to the MHSA, mining firms are obligated to supply suitable hygiene amenities, including lavatories and changing areas, to safeguard the well-being and safety of all workers at the mining location (RSA, 1996b:8). The Mining Charter mandates that mining companies must engage with local communities and provide essential infrastructure as part of their social responsibility (RSA, 2018:3). It also establishes housing requirements aimed at improving mineworkers' living conditions. This includes the conversion of hostels into family units to create a more suitable environment for workers and their families (RSA, 2010a:4). The Charter stipulates an occupancy rate of one person per room in accommodation facilities to ensure adequate space and comfort (RSA, 2010a:4). Furthermore, companies are required to facilitate home ownership options for all mine employees in consultation with organised labour (RSA, 2010a:4). The Mining Charter further stipulates under the housing and living conditions standard section the importance of integrated housing developments that provide access to basic amenities such as healthcare and balanced nutrition in mining communities (RSA, 2018:12). These measures aim to enhance the quality of life for mineworkers and their families, aligning with broader socioeconomic development goals in South Africa.

Notwithstanding the fulfilment of specific legislative requirements, there remains a significant need to improve infrastructure facilities.

Feminist theories advocate for the recognition and dismantling of systemic inequalities and power imbalances between genders, highlighting the need for social, economic, political and cultural equality (Stolley, 2005:26). Specifically, second-wave feminism critiques male-centric workplace designs (Ely & Meyerson, 2000b:109; Ritzer, 2008:463) and advocates for structural reforms (Haralambos & Holborn, 2008:102). Ely and Meyerson's create equal opportunities approach emphasises eliminating structural barriers and providing necessary resources, including childcare support, to enable full participation in traditionally male-dominated fields such as mining (Ely & Meyerson, 2000b:106). Moreover, Ely and Meyerson's assess and revise the work culture approach advocates for a critical evaluation of organisational cultures that implicitly or explicitly marginalise women by reinforcing gendered divisions in workplace spaces and roles (Ely & Meyerson, 2000b:109).

6.4.6 Physical proficiency abilities

In this study, physical proficiency abilities encompass strength, endurance, flexibility and coordination, essential for managing the physically demanding aspects of mining work.

Two five-point and three three-point Likert scales were utilised to assess women's perceived physical proficiency in mining operations. The scales encompassed women's appointments, physical capability, pre-employment medical examinations, tools prohibited for women and restricted work units.

A five-point Likert scale was used to measure perceived appointment practices and women's physical capability. The exploratory factor analysis yielded three factors: appointment practices, women's physical capacity and women's physical challenges, which exhibited acceptable reliability and internal consistency as evidenced by Cronbach's alpha coefficients. Three-point Likert scales comprising the categories Yes (1), No (2) and Don't know/Unsure (3) were used to determine whether women undergo pre-employment medical examinations and are banned from using some equipment and tools and from work units. These were not subjected to a factor analysis.

The factor mean for appointment practices was 3.919, indicating that, on average, the respondents concurred that the mine considers women's physical proficiency abilities, such as medical fitness assessments, physical dimensions and body composition, and physical and functional capabilities, when appointing them to mining positions. The factor mean for women's physical capacity was 4.177, indicating that, on average, the majority of the

respondents concurred that women possess the physical capacity to operate heavy machinery and/or vibrating power tools. The factor mean for women's physical challenges was 4.255, suggesting that, on average, women acknowledged that specific mining tasks can only be performed by men and that they experience physiological strain and challenges when engaging in physically demanding tasks. The data (see Chapter Five, Table 5.27) further revealed positive responses from respondents regarding pre-employment medical examinations, encompassing written questionnaires, standard physical assessments, physical fitness tests and heat tolerance screenings (all 100%). A large majority of the respondents (see Chapter Five, tables 5.28 and 5.29) reported that no workplace equipment and tools or work units are prohibited for women.

The independent samples t-test results (section 6.2.1) revealed that respondents who engage in night shift work had less favourable views regarding women's ability to operate heavy machinery and power tools. The results (section 6.2.2) further showed that respondents who participated in work committees conveyed less favourable opinions regarding appointment practices at the mine (e.g. with respect to considerations of women's body size and build during job allocation) and the physical challenges faced by women when performing mine-related tasks. The correlation test results (section 6.2.6) suggest that having children is positively associated with increased physical constraints faced by women. Moreover, as women's educational attainment increases, there is a discernible reduction in their expression of negative attitudes regarding the physical challenges encountered by women who performing mine work. The correlation tests further suggest that proper appointment practices and addressing physical challenges are closely linked to more favourable attitudes towards the mining company's development opportunities, gender-sensitive facilities, health and safety, and inclusivity measures.

The research results align with studies conducted by Badenhorst (2009), Benya (2009, 2016), Botha (2013), Botha and Cronjé (2015a, 2015b), Mashaba (2022), Moalusi and Jones (2019) and Zungu (2013). Mining work is physically demanding (Benya, 2009, 2016; Botha, 2013; Zungu, 2013:8). Furthermore, mining tasks and equipment, predominantly designed for men, can impose physical strain on women, resulting in elevated injury risks (Zungu, 2013). The absence of gender-specific PPE compromises safety and mobility for women, underscoring the necessity for tailored protective gear (Benya, 2016:226; Botha, 2013:183). As in this study, Benya (2016:185) indicated that women acknowledged that specific mining tasks could only be performed by men, attributing this limitation to the physiological demands imposed by such work. Botha (2013:310–346) highlights women's challenges in meeting the physical demands of mining tasks, particularly those involving heavy machinery. The research results underscore

the pressing need for gender-sensitive approaches in the mining industry, as evidenced by the challenges women face in meeting the physical demands of their roles. Addressing these issues through tailored equipment design and fostering an inclusive work environment is crucial for enhancing women's safety and performance in a predominantly male-oriented industry.

Empirical evidence underscores the necessity for mining companies to align with legislative frameworks such as the MHSA. The MHSA stipulates health and safety standards for all mining employees, necessitating medical fitness tests for specific positions, which can present challenges for women due to physical demands and assessment biases (RSA, 1996b). In particular, Regulation 14.1 states that employers must provide a safe working environment, which includes assessing the fitness and capability of workers to perform their duties safely. It requires medical examinations and assessments considering the work's physical demands (RSA, 1996b:222).

Feminist perspectives provide unique insights into the gendered nature of work in male-dominated industries such as mining. Radical feminism offers a critical lens to analyse women's physical challenges in mining, suggesting that such strain is exacerbated by industries designed around male physical norms. Radical feminists argue that male-dominated work environments such as mining are inherently patriarchal and structured to privilege men by emphasising male capabilities, thereby disadvantaging women (Haralambos & Holborn, 2008:101). This perspective aligns with the critique presented by Ely and Meyerson (2000b:104), who assert that organisational structures, though often framed as gender-neutral, tend to reinforce male dominance. This is achieved by maintaining workplace practices, including policies, procedures and behaviours, and prioritising employee safety, health and productivity while promoting environmental sustainability. Furthermore, Ely and Meyerson's (2000b) assess and revise work culture critiques traditional feminist frames focused solely on equality of opportunity or valuing differences without addressing deeper structural issues sustaining gender inequality. They call for revising workplace cultures and practices that covertly maintain gender disparities by privileging male norms. They argue that mining industries must move beyond superficial equality measures to fundamentally revise social practices that reinforce gendered power imbalances. The recognition by the respondents of the distinct physical challenges faced by women in these industries represents an opportunity to reconsider and potentially reformulate organisational standards that currently define success through male-centric physical standards (Ely & Meyerson, 2000b:115).

6.4.7 Health and safety considerations

Women's health and safety in mining are paramount for ensuring equitable employment and well-being. Providing women with adequate information and protection is imperative in this hazardous industry. This study evaluated women's health and safety, focusing on information dissemination, PPE and workplace safety measures. Two five-point Likert scales were utilised to measure perceived health and safety considerations for women in mining operations.

The exploratory factor analysis yielded four factors: adequate health and safety measures, gender-sensitive PPE, work practices during motherhood and PPE fit. The factors exhibited high reliability and internal consistency, as evidenced by Cronbach's alpha coefficients.

The mean score for the adequate health and safety measures factor was 4.760, indicating that the respondents agreed that the mining company often makes provision for adequate health and safety measures. The factor mean for gender-sensitive PPE was 2.823, indicating that most respondents reported that the mining company rarely to sometimes makes provision for gender-sensitive PPE that is tailored to ensure a comfortable and secure fit for women. Furthermore, the factor mean for work practices during motherhood was 2.010, suggesting that most respondents reported that the mining company rarely implements work practices during motherhood, such as providing alternative employment for women during early motherhood and breastfeeding. The last factor, PPE fit, yielded a mean score of 2.591, indicating that on average, the respondents agreed to some extent that the mining company makes provision for PPE that fits women.

The results of the independent samples t-tests (section 6.2.2) revealed that respondents who participated in work committees conveyed more favourable opinions regarding the comfort of their PPE, including earplugs, gloves, boots and overalls. The ANOVA test results (section 6.2.4) revealed significant differences in perceptions of health and safety measures across various mine work locations. Underground workers exhibited less positive attitudes towards health and safety measures implemented by the mining company than surface workers, and those who work in both environments. In addition, the correlation test results (section 6.2.6) suggested that higher-qualified respondents held less favourable views of the adequacy of health and safety measures, such as equipment handling training, PPE use and HIV/AIDS mitigation strategies. They might be more aware of risks, best practices and the importance of comprehensive health and safety measures, leading them to view the company's measures as inadequate. Furthermore, the correlation test results (section 6.2.7) indicated that enhancements in health and safety measures are linked to favourable perceptions regarding several workplace aspects, including the quality of facilities, appointment practices, physical

challenges faced, availability of gender-sensitive PPE, the suitability of the work environment and the implementation of inclusive workplace practices.

The research results align with those of Benya (2016), Botha (2013) and Zungu (2011). The extant literature indicates that while general health and safety provisions are often in place, tailored measures such as PPE designed for women remain inadequate. For instance, the mining industry has historically provided equipment designed to fit men, creating significant discomfort and safety risks for women due to differences in body shape and size (Benya, 2016:226; Zungu, 2011). The absence of gender-sensitive PPE has been associated with increased risks, including dermatological conditions and injuries, highlighting a critical gap in the implementation of safety measures (Botha, 2013).

As stated in Chapter Four, South African legislation requires equal opportunities and support for women in the workplace. The results underscore the need for mining companies to adhere to laws such as the MHSA and the accompanying code of practice for selecting and providing PPE for women in the South African mining industry. The MHSA mandates that mining operations adhere to stringent safety protocols to protect employees, obligating employers to safeguard employees' health and safety, including the provision of PPE (RSA, 1996b:5). The code of practice aims to address the historical inadequacies in PPE that have disproportionately affected women in mining, who have frequently been required to utilise equipment designed primarily for male physiology, thereby compromising their safety and comfort (DMRE, 2023:10–12). It establishes guidelines for appropriately fitting PPE, accounting for the physiological differences between men and women. It ensures that female workers are not disadvantaged by ill-fitting equipment that may increase the risk of injury. By emphasising the necessity for gender-sensitive PPE, this code directly influences the working conditions of women in the mining industry, contributing to a safer and more equitable work environment (DMRE, 2023:10–12). Consequently, it aligns with broader efforts to enhance occupational safety standards and promote gender equity in traditionally male-dominated industries, providing insights into the practical challenges and policy requirements highlighted in the study (DMRE, 2023).

The results of the study related to health and safety considerations in the mining company can be examined through feminist theory. The low score for PPE fit further illustrates the company's insufficient efforts to accommodate women's needs. This supports Acker's (1990) argument that organisational structures are inherently gendered, perpetuating inequalities through practices favouring masculine norms (Acker, 1990:140). The failure to implement effective work practices during motherhood marginalises women and perpetuates the 'ideal

worker' standard, which excludes caregiving responsibilities typically shouldered by women (Ely & Meyerson, 2000b:120).

6.4.8 Workplace practices

This study examined workplace practices related to gender equality and inclusivity in the mining industry. It examined statements concerning fair treatment, support for skill acquisition, male co-workers' acceptance of female employees and the prevalence of stereotypes and gender bias. A five-point Likert scale was used to measure the perceptions regarding workplace practices in the mining company, specifically regarding women employed in mining operations.

The exploratory factor analysis yielded four factors: conducive work environment, inclusive workplace practices, gender bias and quid pro quo harassment. The factors exhibited high reliability and internal consistency, as evidenced by Cronbach's alpha coefficients.

The mean score for the conducive work environment was 3.578, indicating that the respondents agreed to a moderate extent that the mining company provides a conducive work environment for women by addressing sexual harassment, treating pregnant women with respect and effectively responds to women's concerns in the company. The mean score for inclusive workplace practices was 3.259, suggesting that the respondents agreed to a moderate extent that the mining company promotes inclusive workplace practices such as encouraging skills acquisition regardless of gender and ensuring fair and equal treatment during promotions and development opportunities. Furthermore, the mean score for the gender bias factor was 2.187, indicating that, on average, the respondents indicated that women, to some extent, are still subjected to challenges in the workplace, such as the undermining of women by men, stereotypes, the reluctance of men to take instruction from female employees, disrespectful treatment and isolation. Lastly, the mean score for quid pro quo harassment was 2.362, indicating that the respondents agreed, to some extent, that there is evidence of quid pro quo harassment in the mining company, such as the common practice of sex being exchanged for favours.

The independent samples t-test results (section 6.2.1) revealed that respondents working night shifts perceived the work environment as more suitable for women in mining operations and rated workplace inclusiveness more positively than those who are not required to work night shift. The ANOVA results (section 6.3.3) revealed significant mean score differences in gender bias perceptions across marital statuses. Single respondents experienced slightly less gender bias than those in relationships or who are married, but more than widowed/divorced women. Widowed/Divorced respondents experienced less gender bias than those in

relationships or who are married. The ANOVA results (section 6.2.4) indicated significant differences in mean scores for inclusive workplace practices and quid pro quo harassment. Effect sizes revealed that surface workers rated the mine's inclusive practices more positively than those working underground or both on the surface and underground. Exclusive underground workers perceived higher quid pro quo harassment compared to those working both on the surface and underground. The ANOVA results (section 6.2.5) revealed significant mean score differences with respect to gender bias based on career choice reasons. Effect sizes indicated that respondents prioritising job security reported less agreement on gender bias occurrence than those citing unemployment, difficulty finding another job or other reasons. The correlation test (section 6.2.7) showed that a conducive work environment and inclusive workplace practices are positively associated with favourable perceptions of work environment factors such as development opportunities, quality workplace facilities on the surface and underground, and health and safety measures implemented by the mining company. Conversely, a supportive work environment and inclusive workplace practices are linked to fewer negative perceptions of women's physical capacity and reduced experiences of gender bias. Gender bias negatively correlates with access to development opportunities, quality facilities, support for working mothers, fair work practices, PPE fit and overall inclusivity, indicating that discrimination undermines perceptions of opportunities and support.

The study's results align with those of previous studies conducted by Benya (2017b), Botha (2013), Mashaba and Botha (2023) and Zungu (2011). These investigations demonstrated moderate efforts by mining companies to address issues such as sexual harassment, respectful treatment of pregnant employees and responsiveness to women's concerns. Despite improvements, research indicates that a male-dominated culture persists, often contributing to a less supportive environment for female workers (Benya, 2017a; Mashaba & Botha, 2023). In addition, women in the sector continue to experience challenges such as being undermined and facing reluctance from male colleagues to accept their instructions (Botha & Cronjé, 2015c:31–53). Furthermore, reports of such harassment have been documented in studies, indicating the persistent power dynamics that disadvantage women in the workplace, often exacerbated by a lack of follow-up on complaints (Khoza, 2015:67).

Chapter Four detailed South African legislation requiring equitable opportunities and support for women in the workplace. The research results highlight the need for mining companies to align with frameworks such as the EEA, BCEA, LRA and Code of Good Practice on Handling Sexual Harassment Cases in the Workplace. The EEA aims to eliminate gender bias and ensure fair treatment, prohibiting discrimination based on gender, sex, pregnancy and marital status (RSA, 1998b:10). The BCEA protects women's rights, guaranteeing maternity leave

and ensuring the safety of pregnant and breastfeeding women (RSA, 1997a:15). The LRA fosters fairness and equal opportunities, deeming dismissals related to pregnancy and sex or gender discrimination as automatically unfair (RSA, 1995:42). Nonetheless, the Act's emphasis on addressing unfair labour practices suggests a need for more rigorous enforcement to tackle gender bias and discriminatory attitudes. The Code of Good Practice on the Handling of Sexual Harassment Cases in the Workplace, as specified by the EEA, outlines comprehensive guidelines for employers on managing sexual harassment incidents. It stresses the importance of a harassment-free work environment and mandates employers to take proactive measures to prevent and address sexual harassment (RSA, 1995:42).

Feminist theoretical frameworks provide valuable insights for interpreting the study results. Liberal feminism contends that men and women should not be perceived or treated as fundamentally distinct. Advocates of this perspective argue that women deserve equal rights in terms of legal protection, educational access and employment opportunities equivalent to those afforded to men. Liberal feminism aims to eliminate discriminatory practices and promote gender equality, and therefore support affirmative action policies aimed at integrating women into male-dominated fields and enabling their ascent to leadership positions, effectively dismantling barriers such as the glass ceiling (Lorber, 2010:25). Radical feminism examines power dynamics and patriarchy. It posits that patriarchy is a system through which men oppress women. This perspective asserts that men maintain control over women primarily through sexual and emotional exploitation. In response, radical feminists advocated for the establishment of sexual harassment policies and punitive measures, particularly in the workplace (Lorber, 2010:121). The create equal opportunities approach focuses on structural barriers to women's recruitment and advancement, rooted in organisational power structures and biased opportunity practices (Ely & Meyerson, 2000b). Kanter (1987:37–53) describes these as differential opportunity structures, resulting in biased hiring, evaluation and promotion processes and gender segregation in occupations and workplaces. Acker and Van Houten (cited by Ely & Meyerson, 2000b:12) suggest policy-based interventions to address these issues, aiming to eliminate structural and procedural barriers to women's success. Legislative and organisational policies, such as affirmative action, revised recruitment procedures, transparent promotion policies, sexual harassment policies, mentoring programmes (Kram, 1986), alternative career paths (Schwartz, 1989) and work–family benefits (Bailyn, 1993), are crucial. These policies address structural barriers, particularly women's caregiving responsibilities, and should be designed to eliminate or compensate for barriers hindering women's competitive equity (Ely & Meyerson, 2000b:12; Meyerson & Kolb, 2000:562).

6.4.9 Personal information

The study aimed to determine the influence of work at the mine on various personal life factors. A four-point Likert scale (negative influence (1), no influence (2), positive influence (3) and not applicable (4)) was used to measure the influence of work on various personal life factors. The exploratory factor analysis yielded one factor: women's work at the mine and their personal lives. The factor exhibited high reliability and internal consistency, as evidenced by Cronbach's alpha coefficients.

The mean score for women's work at the mine and their personal lives was 2.019, indicating that, on average, the respondents reported that women's work at the mine does not significantly affect their personal lives in terms of encouraging marital/partner conflict and influencing their childcare responsibilities, their community involvement, their relationships with their friends and family and their overall health and wellness.

The correlation test (section 6.2.7) suggests that the more the respondents' personal lives intersected with their work at the mine, the greater their interest in development opportunities, childcare and breastfeeding facilities, and inclusive workplace practices. These included aspects such as specialised on-the-job training, mentorship programmes, access to quality childcare and adequate breastfeeding facilities and fair and equal treatment of women, including acceptance by male co-workers.

The study's results are consistent with those of previous studies conducted by Benya (2009), Mashaba (2022) and Valadares *et al.* (2022:4). While mining occupations are demanding, factors such as extended working hours and remote locations are frequently the primary sources of strain for workers attempting to balance familial and professional responsibilities (Mashaba, 2022:104). Numerous women have adapted to these conditions, or their roles do not significantly exacerbate familial or social tensions. This aligns with findings by Valadares *et al*. (2022:4), who observed that caregiving duties are challenging and that structured support, such as family and community networks, can mitigate the adverse impacts of mining work on women's domestic lives. Furthermore, some studies emphasise that childcare support remains a significant challenge in mining communities, indirectly affecting women's ability to balance occupational and familial responsibilities (Benya, 2009:18).

The research results underscore the need for mining companies to ensure that their practices align with legislative and regulatory guidelines, such as the LRA and BCEA. The LRA upholds fair labour practices. Section 23 ensures the right to fair labour practices, safeguarding workers' dignity and right to a work environment that respects their personal lives (RSA, 1995:30). The LRA ensures that work practices do not unduly affect personal matters. The

BCEA establishes minimum employment conditions to support workers' well-being. Section 27 of the BCEA permits family responsibility leave for emergencies, children's illnesses or family deaths (RSA, 1997a:19), emphasising the imperative to balance work and personal life. This provision enables women in mines to address familial needs without incurring work-related penalties. Although the results suggest minimal impact on women's personal lives in the mining industry, this legislation provides a framework to address potential work-related issues.

Feminist thoughts offer a valuable lens for interpreting the study's results. Bailyn (cited by Ely & Meyerson, 2000b:118) asserts that the division between the public and private spheres is a prevalent gender issue in contemporary organisations. This division reinforces the sexual division of labour, wherein men are perceived as suited for public sphere occupations and women for managing household responsibilities in the private sphere (Berdahl *et al*., 2018:429; Ely & Meyerson, 2000b:118, 2010:3–4; Mogorosi, 2007:511–512).

Liberal feminists advocate for the abolition of discrimination, sexism and gender stereotypes. They promote equal educational and economic opportunities, shared family responsibilities and challenged individual sexism (Ritzer, 2008:466). Their objectives include addressing workplace discrimination, sexual harassment and equal pay through legislation, litigation, regulation and fairness arguments (Haralambos & Holborn, 2008:102).

6.5 CHAPTER SUMMARY

This chapter first presented the empirical results on the inferential statistics and then discussed and interpreted the results presented in chapters Five and Six in relation to the literature review.

The comparison tests (independent samples t-tests, ANOVAs, effect sizes and Spearman's rank-order correlation coefficient) aimed to explore the relationship between socio-demographic variables and the factors related to the working conditions of women employed in mining operations. The results revealed that factors such as night shift requirements, work committee participation, marital status, having children, work location (underground, surface or both), highest qualification and primary reason for choosing a mining career significantly influence women's perceptions of their working conditions. These results highlight the complex interplay between socio-demographic variables and women's working conditions in mining, stressing the need for interventions to address the diverse factors affecting their work experiences.

The research results further indicate that company benefits and policies, development opportunities, infrastructure (on the surface and underground), physical proficiency abilities, health and safety considerations, and workplace practices significantly influence the working conditions and experiences of women employed in mining operations.

Regarding company benefits, the results showed that the mining company has successfully implemented key benefits for its employees, such as housing, medical aid, pension plan, life assurance, performance bonuses, training opportunities, study leave and maternity benefits. However, certain critical areas remain inadequately addressed. These include provisions for travel or transport allowances, cell phone allowances, shift allowances, remoteness leave, bursaries and scholarships for employees and their dependants, as well as specific support for women with young children, such as day shifts and childcare facilities. Addressing these deficiencies is essential for the company to enhance its benefit structure and align it with the comprehensive welfare of its workforce.

Concerning company policies, the results indicated that the mining company has effectively implemented a diverse range of gender-sensitive policies, with widespread awareness among the workforce. The unanimous recognition of the employment equity and sexual harassment policies underscores the company's commitment to fostering an equitable and inclusive workplace. Furthermore, the high level of awareness concerning additional policies, such as skills development, maternity, gender-based health and safety, and leave, suggests that the company's efforts to promote gender sensitivity have been effectively communicated to its employees, reinforcing its inclusive policy framework.

Regarding development opportunities, the results indicated that although the mining company has implemented programmes to support women's professional development in mining operations, these initiatives are only partially recognised by employees, suggesting potential for improvement. While there is some provision for career advancement, including training and mentorship, the company needs to enhance financial support and increase awareness of study assistance schemes. Furthermore, perceptions of these opportunities vary across different relationship statuses, with single women viewing them more favourably. Addressing identified barriers, such as gender bias and physical challenges, could further enhance women's access to and benefit from these opportunities.

In terms of infrastructure facilities, the results indicated that while the mining company has made progress in providing certain infrastructure facilities for women, such as surface amenities and housing options, significant deficiencies persist, particularly in childcare and breastfeeding facilities. The limited availability of these crucial support structures may

adversely affect the retention and inclusivity of female employees. Furthermore, women who perceive workplace amenities as more supportive demonstrate a higher likelihood of positively viewing other aspects of the work environment, underscoring the importance of further enhancing gender-sensitive infrastructure to foster a more inclusive and equitable workplace culture.

Regarding physical proficiency capabilities, the study's results suggested that while women in mining operations perceive themselves as physically competent to manage demanding tasks, they also recognise the physiological challenges associated with certain aspects of the work. Efficacy appointment practices that consider physical proficiency, such as pre-employment fitness assessments, are generally regarded as favourable, although concerns persist regarding their implementation. Moreover, perceptions of physical challenges are influenced by variables such as shift work, committee involvement and parental responsibility. Addressing these challenges through appropriate support and consideration of physical demands is essential for enhancing women's experience and fostering a more inclusive work environment in the mining industry.

In terms of health and safety considerations, the results indicated that while the mining company generally provides adequate health and safety measures, significant deficiencies exist in providing gender-sensitive PPE and support for work practices during maternity. These shortcomings suggest that the company's efforts in addressing women's specific safety requirements remain insufficient. Furthermore, perceptions of health and safety measures exhibit variation across work locations, with underground workers and higher-qualified respondents expressing lower levels of satisfaction, potentially due to enhanced awareness of industry standards. Addressing these deficiencies could improve safety and inclusivity for women in the mining industry.

The study's results on workplace practices revealed that while the mining company has implemented measures to create a favourable and welcoming work environment for women, substantial obstacles persist, notably concerning gender discrimination and sexual harassment. The moderate consensus on inclusivity indicated progress in supporting skill development and equitable treatment; however, enduring stereotypes and opposition from male colleagues continue to have an impact on women's work experiences. Addressing these issues, particularly in underground work environments, is crucial for improving inclusivity and ensuring equal opportunities for women in the mining industry. Enhancing workplace practices could improve the perceptions of fairness and foster a more supportive environment.

Furthermore, the study's results revealed that, on average, employees perceive their occupational activities at the mine to have a minimal impact on their personal lives, including familial relationships, community engagement and overall well-being. Nevertheless, the results also indicated that when professional and personal domains intersect, there is heightened emphasis on the need for development opportunities, childcare and breastfeeding facilities, and workplace practices promoting inclusivity. This underscores the importance of tailored workplace support mechanisms that can effectively integrate professional and personal aspects, particularly for women who have multiple responsibilities.

The study's results elucidated the multifaceted influences of socio-demographic factors, company benefits and policies, development opportunities, infrastructure facilities, physical capabilities, health and safety considerations, workplace practices and work–life balance on the working conditions of women in mining operations. The results underscored the critical necessity for the mining company to address deficiencies in support structures, particularly gender-sensitive facilities and work practices, to foster a more inclusive and equitable environment for female employees. These insights provided a foundation for the subsequent chapter, presenting the study's conclusions and recommendations.

CHAPTER SEVEN

CONCLUSIONS AND RECOMMENDATIONS

7.1 INTRODUCTION

Chapter One introduced the research and outlined the study's objectives and significance. Chapters Two to Four summarised the literature by outlining the study's theoretical framework, global and national trends and perspectives on women in mining, and the statutory frameworks (legislation and policies) applied to women working in the South African mining industry. Chapter Five presented an overview of the study's research methodology and how it was implemented and operationalised. It also presented and discussed the biographical information of the respondents, as well as the descriptive statistics and the reliability and validity of the variables used in the study. Chapter Six presented and discussed the results of the inferential statistics and interpreted the study's results in terms of the literature reviewed. This chapter concludes the research and is structured as follows: The second section presents the conclusions on the research objectives, the third section delineates the limitations of the study, the fourth section proposes practical recommendations and areas for future research, drawing upon insights garnered from both the literature review and the empirical results, and the final section summarises the results.

7.2 CONCLUSIONS ON THE RESEARCH OBJECTIVES OF THE STUDY

The general objective of this study was to explore the current working conditions of women employed at a platinum mine in South Africa. Consequently, the study's main objective was to examine the current working conditions of women employed in mining operations at a platinum mine in South Africa. To address the main objective, the following specific research objectives were formulated:

Research objectives regarding the literature review:

1 To analyse the existing approaches, perspectives and theories related to gender and organisational change and to determine how they can contribute to effect change to enhance women's position, in general, and women's working conditions, specifically, in the South African mining industry
2 To determine the global and national trends and perspectives relating to women workers in the mining industry

3 To analyse the statutory frameworks (legislation and policies) applying to women working in the South African mining industry
4 To describe the research methodology that will be used to explore the working conditions of women employed in mining operations at a platinum mine in South Africa.

Research objectives regarding the empirical study:

5 To determine the working conditions of women employed in mining operations at a platinum mine in South Africa and to analyse and document the results
6 To assess the relationships between selected socio-demographic variables and the working conditions of women employed in mining operations at a platinum mine in South Africa
7 To draw up conclusions and recommendations emanating from the literature review and empirical results to assist the mining company to effect change and consequently improve the working conditions of women employed in mining operations at the platinum mine

The following section discusses the results and conclusions on the research objectives.

7.2.1 Objective 1

Objective 1 was to analyse the existing approaches, perspectives and theories related to gender and organisational change and to determine how they can contribute to effect change to enhance women's position, in general, and women's working conditions, specifically, in the South African mining industry. Chapter Two addressed this objective. The literature review elucidated several themes crucial for understanding gender and organisational change, namely key terms and theoretical frameworks explicating gender and organisational change, such as feminist theory and feminist approaches to gender equity and organisational change. The following conclusions are presented regarding Objective 1.

Conclusion 1

From Chapter Two, it was evident that concepts such as sex and gender, gender equity, equality and inequality, organisational change and a gendered perspective on organisational change are significant, as they provide precise definitions and establish a foundational understanding for analysing gender-related issues in organisations. The distinction between sex as a biological attribute and gender as a socially constructed phenomenon is crucial, as it frames the discourse on how gender roles and expectations influence organisational dynamics. Gender is conceptualised as a characteristic of individuals and as a system of social

practices that shape interactions, power relations and resource distribution in organisations (Lorber, 1994; Ridgeway & Correll, 2000). Comprehending these distinctions is essential for analysing how gendered practices perpetuate inequality in the workplace, particularly in male-dominated industries such as mining.

Conclusion 2

Feminist theory provides a critical analytical framework through which gender-related issues in organisations can be comprehended. It postulates that gender inequalities are not inherent or inevitable, but socially constructed and perpetuated through various institutional practices. The three waves of feminism – first, second and third – offer distinct perspectives on how gender inequality has been historically addressed and continues to evolve. First-wave feminism concentrated on legal rights and political representation, second-wave feminism on broader social and economic inequalities, and third-wave feminism on the intersectionality of gender with other social categories such as race and class (Ritzer, 2008:450–453). These theories collectively advocate for the dismantling of patriarchal systems that marginalise women and reinforce male dominance, which is particularly pertinent in industries such as mining, where traditional gender roles are deeply entrenched. Feminist theories provide critical frameworks for understanding and addressing gender inequities in workplaces, particularly in male-dominated sectors such as the South African mining industry. These theories emphasise the need for both individual empowerment and systemic change to alleviate women's working conditions.

Conclusion 3

The chapter explored four feminist approaches to organisational change, each proposing measures for improving women's position in organisational settings, including their working conditions. These approaches are particularly relevant in male-dominated sectors such as mining. The approaches discussed include the following:

Fix the women. This approach concentrates on equipping women with the necessary skills and traits for success in male-dominated environments. While it facilitates individual women's success, it often fails to challenge the broader organisational structures perpetuating gender inequities, thereby maintaining the status quo (Ely & Meyerson, 2000b:106–107).

Value the feminine. This approach seeks to recognise and valorise the distinct skills and perspectives that women bring to the workplace. However, it risks reinforcing gender stereotypes and does not adequately address the structural processes that create and sustain gender differences (Ely & Meyerson, 2000b:108–110).

Create equal opportunities. This approach aims to establish parity for women and men by eliminating structural barriers and biases. It encompasses interventions such as affirmative action and family-friendly policies. However, it often conceptualises work–life balance as a 'women's problem' and does not significantly impact organisational culture or power dynamics (Ely & Meyerson, 2000b:110–113).

Assess and revise the work culture. This approach offers a more comprehensive strategy by examining and revising the underlying social practices in organisations that perpetuate gender inequalities. It transcends surface-level interventions to challenge the deeply entrenched norms and practices that sustain male privilege. This approach is considered the most promising for effecting lasting change, as it continuously interrogates and disrupts the gendered social order in organisations (Acker, 1990; Ely & Meyerson, 2000b:113–115).

By challenging entrenched masculine norms and advocating for structural reforms, these approaches offer strategic pathways to enhance gender equity in organisations.

7.2.2 Objective 2

Objective 2 was to determine the global and national trends and perspectives relating to women workers in the mining industry. This objective was addressed in Chapter Three. The literature review provided a global, African and national overview of women employed in the mining industry, including their working conditions and the factors influencing them. The following conclusions are presented regarding Objective 2.

Conclusion 1

The representation of women in the mining industries of Australia, Brazil, Canada and the UK has demonstrated improvement; however, achieving gender parity remains a significant challenge. Despite legislative reforms and initiatives, substantial disparities persist across workforce representation, leadership roles and various operational positions. Currently, women constitute 15 to -17% of the mining workforce in these countries. Initiatives such as WIMC and WIM UK aim to advance gender equality; nevertheless, women remain underrepresented in high-impact roles and encounter various barriers in the work environment. These barriers include entrenched discrimination, gender-based harassment, limited opportunities for career advancement, health and safety concerns, and challenges in balancing work and family responsibilities. Collaborative efforts among governments, industry stakeholders and civil society are critical to addressing these barriers and fostering inclusive work environments.

Conclusion 2

Ghana, Rwanda and Zimbabwe have implemented legislative frameworks for gender equality in large-scale mining, but women's inclusion remains limited due to societal and structural barriers. Despite their significant involvement in artisanal and small-scale mining, women in Ghana are underrepresented in large-scale mining due to cultural norms such as traditional gender roles and patriarchy, which often prohibit and, to some extent, discourage women from entering the large-scale mining, inflexible work conditions and insufficient childcare provisions. Rwanda's policies aim to enhance women's inclusion in large-scale mining, but they remain predominantly engaged in artisanal and small-scale mining, facing gender discrimination and inadequate support systems. In Zimbabwe, despite the establishment of initiatives such as the Mthandazo Women Mining Service Centre, women continue to face significant societal, cultural and workplace obstacles to participating in large-scale mining. Systemic issues such as discrimination, cultural norms, traditional gender roles and lack of infrastructure persist across all three countries. Collaborative efforts among stakeholders and targeted interventions addressing childcare, flexible work arrangements and campaigns against workplace discrimination are essential for achieving comprehensive gender equality in large-scale mining in these countries.

Conclusion 3

Women comprise 19.2% of the mining workforce in South Africa as of 2023. Legislation, such as the MHSA (1996), the MPRDA (2002) and the Mining charters (2004, 2010 and 2018), has promoted women's participation in the sector. Although women's participation in South Africa's mining industry has increased, there is still a long way to go before they are adequately represented ~~in the sector~~. Furthermore, they still experience significant challenges in the sector, such as discrimination, workplace harassment, limited career advancement and health and safety risks. In addition to legislation, initiatives such as WIMSA are crucial in addressing these challenges by providing support through mentorship programmes, skills development and advocacy for equitable workplace practices. A concerted effort involving industry stakeholders and governmental support is essential to create a more inclusive environment enabling women to thrive in South Africa's mining industry.

Conclusion 4

The working conditions of women in mining globally are significantly influenced by various interrelated factors (see Chapter Three, section 3.5), which create substantial barriers to their participation, advancement and well-being. These factors encompass (1) gender and cultural

stereotypes and biases, (2) work–life balance challenges, (3) workplace culture issues, (4) recruitment and selection (e.g. women's reluctance to enter the mining industry is primarily driven by fear of societal backlash against deviating from traditional gender norms, compounded by factors such as micro-inequities, ingrained biases and their educational choices, which further influence recruitment and selection processes in the industry), (5) job segregation, (e.g. the division of jobs based on gender, which relegates women to lower-paying, less-skilled roles, compounding these challenges), (6) disparities in access to essential benefits (e.g. unequal access to benefits such as health insurance, retirement plans and paid leave undermines the job security and overall well-being of women), (7) wage disparities, (8) limited career development opportunities such a training, mentorship and career guidance, (9) structural barriers encompassing physical and organisational components that influence the conditions and working environments of women such as the provision of inadequate changing houses, housing, childcare facilities, transportation and gender-based policies, and (10) health and safety risks (e.g. the provision of inadequate PPE). Addressing these challenges necessitates comprehensive strategies that the government, mining industry leaders and employees, trade unions, and educational and research institutions should devise to promote gender diversity, ensure equitable working conditions and foster inclusive workplaces where women can thrive.

7.2.3 Objective 3

Objective 3 was to analyse the statutory frameworks (legislation and policies) applying to women working in the South African mining industry. This objective was addressed in Chapter Four. The literature review examined the Constitution, labour and mining legislation to understand the legislative framework that governs the South African mining industry's labour force, specifically regarding women. The following conclusions are presented regarding Objective 3.

Conclusion 1

The South African Constitution of 1996 provides the legal foundation for promoting gender equality in the workplace, including the mining industry. Sections ~~such as~~ 9 (equality), 10 (human dignity) and 23 (labour relations) are particularly pertinent, providing a comprehensive framework that ensures the right to fair labour practices, prohibits discrimination and upholds human dignity in the work environment. Notwithstanding these provisions, gender inequality persists in the mining industry, indicating a discrepancy between constitutional ideals and practical implementation.

Conclusion 2

South African labour laws, including the LRA, BCEA and EEA, provide comprehensive protection for workers, with specific provisions aimed at enhancing the working conditions of employees, including women. However, these legislative measures have not been fully efficacious in addressing gender disparities in the mining industry, particularly related to career advancement and working conditions. The codes of good practice introduced by the DoL and the DMRE provide guidelines to employers on various critical issues, including the arrangement of working time, protection of employees during pregnancy and after childbirth, equal pay for work of equal value, prevention and elimination of workplace harassment, and the selection and provision of PPE for women in the South African mining industry. Emphasising fair treatment and the health and safety of employees, these frameworks promote social justice, address historical disparities and enhance employee well-being. Integrating these codes within South Africa's legislation shows a progressive approach to fostering an inclusive and respectful workplace culture.

Conclusion 3

Mining-specific legislation, such as the MHSA, MPRDA, and the Mining Charter, has significantly advanced the integration of women into the mining workforce and improved their working conditions. Nevertheless, challenges persist, as outlined in Chapter Three and summarised in the section above. Although legislative frameworks in the mining industry have made significant progress towards gender equity, persistent limitations underscore the necessity for continued efforts to foster a more inclusive environment for women. This necessitates a comprehensive approach beyond legislative compliance to address cultural, structural and systemic barriers impeding women's full participation. By promoting an inclusive organisational culture, enhancing support systems and ensuring gender-sensitive health and safety standards, the mining industry can advance towards gender equity.

7.2.4 Objective 4

Objective 4 was to describe the research methodology that will be used to explore the working conditions of women employed in mining operations at a platinum mine in South Africa.

The research methodology utilised in this study was elucidated in chapters One and Five. The methodology encompassed a literature review and an empirical study. The empirical study adopted a quantitative approach, utilising quantitative methods and techniques for sampling, data collection and analysis. The research setting was confined to one platinum mine in South Africa; the mine was selected based on availability (convenience sampling). The study's target

population comprised women working in mining operations underground and on the surface of the sampled mine. For this study, a structured questionnaire (see Annexure A) was employed to collect the data. This study applied several statistical analyses, including exploratory factor analysis, descriptive statistics, Spearman's rank-order correlations, independent samples t-tests, ANOVAs and effect sizes to analyse the data. A concise description of the methods and techniques utilised is provided below – a detailed discussion of the quantitative data analysis techniques can be found in chapters Five and Six.

Conclusion 1

The literature review established a robust theoretical framework for comprehending key terminology, global and national trends and perspectives concerning female employees in the mining industry and the factors influencing their working conditions. The literature review enabled a thorough understanding of female employees' experiences, challenges and opportunities in the mining industry. Furthermore, the literature review analysed global and national policies, including anti-discrimination legislation and workplace regulations, and demonstrated how legal structures improved women's working conditions. Furthermore, the review informed the development of the questionnaire, ensuring that the inquiry was grounded in established research and aligned with pertinent statutory provisions.

Conclusion 2

The research methodology delineated for investigating the working conditions of women employed in mining operations at a platinum mine in South Africa was comprehensive and methodologically sound. The study used a quantitative research approach underpinned by an objectivist ontology, empiricist epistemology and a positivist paradigm, which facilitated the systematic and empirical examination of the research problem (Chapter Five). This methodological approach was efficacious in yielding measurable and statistically analysable data, essential for comprehending the complex dynamics of women's working conditions in such a challenging environment.

Using a structured questionnaire ensured that data collection was consistent and comprehensive, encompassing various aspects of the women's working conditions, including socio-demographic information, company benefits, company policies, development opportunities, infrastructure facilities, physical proficiency abilities, health and safety considerations, workplace practices and personal information. The high response rate (196 out of 200 distributed questionnaires) underscores the relevance and engagement of the

respondents with the research topic, indicating that the selected methodology successfully captured the experiences and perceptions of the target population.

Descriptive and inferential statistical techniques were employed to analyse the collected data, ensuring that the results were reliable and valid. The application of exploratory factor analysis, Cronbach's alpha for reliability and various statistical tests (e.g. independent samples t-tests, ANOVA, Spearman's rank-order correlation coefficient and effect sizes) provided a robust analytical framework to interpret the data. These methods ensured that the study could accurately identify key factors influencing the working conditions of women in the mining industry.

7.2.5 Objective 5

Objective 5 was to determine the working conditions of women employed in mining operations at a platinum mine in South Africa and to analyse and document the results. This objective was addressed in Chapter Five. The following conclusions are presented regarding Objective 5.

Conclusion 1

The research on the working conditions of women employed in mining operations at a platinum mine in South Africa revealed several key insights:

Socio-demographic information. The majority of women employed in mining operations at the platinum mine were black African, aged between 30 and 49 and married, and had children. Most respondents worked underground, did not work night shifts and had been employed in the mining environment for over a decade. This indicates that the women in this sector are generally experienced and have considerable responsibilities both in their professional and domestic spheres.

Company benefits. The study found that the mine provides several company benefits, including medical aid, housing and maternity benefits, which the employees positively receive. However, there are significant deficiencies in the provision of benefits such as transport allowances, shift allowances and childcare, which are crucial for enhancing the work–life balance and overall well-being of women in mining.

Company policies. The results indicate that the mining company has effectively implemented various gender-sensitive policies that are widely recognised among employees. The universal acknowledgement of employment equity and sexual harassment policies underscores the company's commitment to an inclusive workplace. Furthermore, the extensive awareness of

policies concerning skills development, maternity, gender-based health and safety, and leave suggests effective dissemination of the company's gender sensitivity initiatives, thereby reinforcing its inclusive policy framework.

Development opportunities. While some provisions for career development exist, such as mentorship programmes and leadership development opportunities, the support provided is inconsistent, and there is significant scope for improvement, particularly in financial support for career development and effective mentorship programmes. This lack of consistent support may impede women's career progression in the mining industry.

Infrastructure facilities. The study revealed inadequate infrastructure, particularly related to hygiene and privacy, affecting female miners. Sanitary facilities, including lavatories, changing facilities and hand-washing stations, were insufficient, especially in underground areas. The lack of childcare and lactation facilities further disadvantaged female employees with young children. Critical deficiencies were identified in both surface and underground infrastructure, highlighting the need for comprehensive amenities such as ablution facilities, childcare and housing solutions. While some surface amenities are acknowledged, underground amenities are notably lacking, impeding women's participation in mining and reinforcing systemic gender biases.

Physical proficiency and appointment practices. The results indicated that women are selected for roles based on their physical and functional capabilities, with emphasis on their physiological attributes during the selection process. The study revealed that although women are generally perceived as capable of performing strenuous mining tasks, they also encounter significant physical challenges in certain roles. Selection practices consider women's physical proficiency; however, concerns arise regarding task allocation and the physical strain experienced by women in mining. The results underscored the need to refine appointment practices and address women's specific physical challenges to establish more inclusive and supportive working conditions in the mining industry. Addressing these issues is crucial for enhancing women's participation and professional development in mining operations.

Health and safety considerations. The study elucidated critical inadequacies in occupational health and safety protocols for female miners, particularly regarding gender-specific PPE and practices during maternity. Despite generally positive perceptions, substantial disparities persisted, notably among underground workers and those with higher qualifications. The results underscored the imperative for mining companies to enhance gender-specific safety measures and ensure comprehensive support for women's health and well-being across all

occupational strata, which is fundamental for fostering equitable and secure mining work environments.

Workplace practices. The results revealed moderate advancements in fostering gender equality and inclusivity in the mining industry; however, gender bias and quid pro quo harassment remained prevalent, particularly among underground workers. The results underscore the necessity for targeted interventions to address these disparities and establish a more equitable work environment for women in the sector.

Personal information. This study's results demonstrated that women's employment in the mining industry had minimal impact on their personal lives, as evidenced by the low mean score. However, correlation analysis revealed that the women exhibited increased interest in professional development opportunities, childcare provisions, breastfeeding facilities and inclusive workplace practices when their personal and professional spheres intersected. These results emphasise the necessity of prioritising work–life balance and enhancing women's professional development and well-being in the mining industry through targeted interventions.

7.2.6 Objective 6

Objective 6 was to assess the relationships between selected socio-demographic variables and the working conditions of women employed in mining operations at a platinum mine in South Africa. This objective was addressed in Chapter Six. The following conclusions are presented regarding Objective 6.

Conclusion 1

The assessment of the relationships between selected socio-demographic variables and the working conditions of women employed in mining operations at a platinum mine in South Africa revealed several significant results:

Night shifts and working conditions. Women employees assigned to night shifts reported enhanced perceptions of childcare and breastfeeding facilities, the conduciveness of the work environment and inclusive practices. However, they expressed lower confidence in their ability to operate heavy machinery and power tools compared to their counterparts who did not work during night shifts.

Participation in work committees. Women who participated in work committees reported more favourable opinions regarding PPE fit, but negative perceptions regarding appointment

practices at the mine and the physical challenges women experience than those women who did not participate in work committees.

Marital status. Unmarried women reported more favourable perceptions regarding developmental opportunities and fewer gender-based biases than their married counterparts. This observation suggest that marital status influences perceptions of career development and workplace inclusivity.

Place of work (underground vs. surface). Women employees engaged in surface-level work demonstrated more favourable perceptions of workplace amenities, including childcare and breastfeeding facilities, inclusive workplace practices, and health and safety measures, than their counterparts working underground. Nevertheless, they reported higher perceived levels of quid pro quo harassment than those employees who worked underground and both underground and on the surface.

Primary reason for selecting a career in mining. Women citing job security perceived amenities more favourably and reported lower levels of gender bias compared to other groups. These results indicated that employment motivations, especially job security, significantly influence workers' views on gender equity and workplace amenities in the mining industry.

Age, children, qualifications, how long have you been working in the mining environment and level of employment. Age was not significantly correlated with working conditions. However, the presence of children was associated with increased physical challenges and a more pronounced effect on women's personal lives, such as increasing marital/partner conflict, childcare responsibilities, community involvement, relationships with friends and family, and overall health and wellness. In addition, education level was associated with reduced physical challenges and lower satisfaction with health and safety measures. Furthermore, the longer the respondents worked in the in the mining industry was associated with diminished optimism regarding career advancement.

7.2.7 Objective 7

Objective 7 was to draw up conclusions and recommendations emanating from the literature review and empirical results to assist the mining company to effect change and consequently improve the working conditions of women employed in mining operations at the platinum mine. Objective 7 is addressed in this chapter. The preceding sections present the conclusions, and the recommendations are delineated in section 7.4.

7.3 LIMITATIONS OF THE STUDY

The study encountered several limitations that were anticipated in Chapter One (section 1.9). A significant constraint was acquiring access to the mine, necessitating the researcher to seek assistance from contacts at the MQA who possessed the contact details of registered mining companies in South Africa. The Covid-19 pandemic and the associated lockdowns further constrained the data collection process, which affected the methodology, timing and duration of data gathering. Strict guidelines had to be followed during data collection, and the inaccessibility of respondents and mines during this period posed additional challenges. Moreover, the fact that mines operated on multiple shifts complicated the scheduling of face-to-face questionnaires. To mitigate this issue, appointments were scheduled to coincide with shift changes, allowing the researcher to meet respondents as they arrived for or departed from work. This was facilitated with the assistance of the mine's human resource personnel. The study's utilisation of a non-probability sampling technique also limited the ability to generalise the results to the broader population of women employed in mining operations in South Africa. Furthermore, the research was conducted in a single mine, restricting the applicability of the results to the respondents involved in this study. Consequently, the results and conclusions of the study may not be generalisable to all women employed in the South African mining industry.

7.4 RECOMMENDATIONS AND AREAS FOR FUTURE RESEARCH

This section presents the practical, theoretical and methodological recommendations and areas for future research that could be implemented by various stakeholders, including government institutions, mining companies and employers, and academia.

7.4.1 Practical recommendations

The following practical recommendations can be implemented by mining companies to improve the working conditions of women employed in mining operations:

- The study highlighted persistent issues of gender discrimination, unequal development opportunities, and harassment within the mining company. Employees indicated only a moderate level of satisfaction with workplace diversity and development. Gender-sensitive policies addressing harassment, equitable promotions, and inclusivity in leadership can address these identified gaps and improve employee perceptions.
- The study found enduring gender biases and stereotypes that hinder the full integration of women into the mining workforce. Conducting regular audits would help identify persistent biases and inform the design of training programs to challenge entrenched

norms, particularly in underground work environments where opposition to female workers remains a significant issue.

- The results emphasised the importance of diversity-sensitive leadership to mitigate resistance from male colleagues and ensure that both men and women feel supported and valued. Identifying these dynamics through leadership training would facilitate a more equitable decision-making culture.
- The study revealed biases in hiring and promotion processes, including limited access to leadership roles for women and discriminatory appointment practices. To prevent these biases, it is essential to eliminate unconscious bias training for recruitment and promotion personnel.
- The findings identified significant deficiencies in infrastructure, including the lack of childcare and breastfeeding facilities. Women reported challenges balancing professional and personal responsibilities. Implementing family-friendly policies and on-site childcare would alleviate these challenges and increase female retention rates.
- A key finding was the inadequate provision of gender-sensitive PPE, which exposed women to heightened safety risks and discomfort. The company's low score on PPE has further underscored the need for improvements in this sector. Developing ergonomically appropriate PPE for women would address these safety and health concerns directly.

7.4.2 Theoretical recommendations

Considering the literature review and empirical research results, the following theoretical recommendations are proposed:

- Women in the mining industry may experience multiple layers of discrimination, encompassing gender-based bias as well as racial and class-based exploitation. This phenomenon is particularly prevalent among women from indigenous backgrounds or those belonging to ethnic minorities. Future research could employ an intersectional approach to investigate how these women encounter diverse forms of oppression. Such investigations would consider the interplay of factors such as race, class, ethnicity and other intersecting identities, rather than focusing solely on gender.
- Future research should integrate a feminist political economy framework with transformative justice principles based on African feminist philanthropy to address structural inequalities perpetuating gender discrimination in the mining industry. This approach necessitates an examination of the economic and social systems that sustain gender disparities while concurrently prioritising community-driven initiatives aimed at transforming these structures. By centring the voices and experiences of marginalised women, this framework can provide a nuanced understanding of the

intersectional challenges women encounter in mining. Furthermore, it can inform the development of targeted strategies that empower women, promote equity and foster sustainable change in the sector, ensuring that interventions are culturally appropriate and address the fundamental causes of gender discrimination.

7.4.3 Methodological recommendations and areas for future research

Taking into account the literature review and empirical research results, the following recommendations are proposed:

- A mixed-methods research approach, combining quantitative and qualitative insights, can be followed to understand women's experiences comprehensively.
- Longitudinal studies could be conducted to assess whether working conditions for women employed in mining operations have improved.
- Comparative studies between different mining companies and different sectors in the industry could be conducted to identify key challenges and best practices to enhance women's experiences in the industry.
- Research could be conducted to understand the role of male allies in promoting gender equity and cultivating a supportive workplace culture for women in the mining industry.

These recommendations and research areas collectively aim to address gender inequities and enhance the working conditions of women in the mining industry, contributing to the creation of a more inclusive and equitable environment. These focal areas underscore the persistent need for ongoing research aimed at addressing gender disparities and improving working conditions for women in traditionally male-dominated industries such as mining.

7.5 SUMMARY OF THE STUDY

The general objective of the research was to investigate the current working conditions of women employed at a platinum mine in South Africa and, consequently, to determine potential improvements to the working conditions of women employed in mining operations in South Africa. This objective was addressed through the following seven chapters:

The first chapter presented the introduction, orientation and background. It also delineated the research problem, objectives, questions and methodology. The chapter also addressed the study's ethical considerations, limitations and significance.

The second chapter examined the extant approaches, perspectives and theories on gender and organisational change. It elucidated key terms and theoretical frameworks explicating

gender and organisational change, such as feminist theory and feminist approaches to gender equity and organisational change.

The third chapter examined the global and national trends and perspectives pertaining to women's employment in the mining industry across various regions and the factors influencing their working conditions.

The fourth chapter analysed the statutory and regulatory frameworks governing the South African mining industry's labour force, including women.

The fifth chapter presented an overview of the study's research methodology and its implementation and operationalisation. It also discussed the socio-demographic information of the respondents and the descriptive statistics, as well as the reliability and validity of the variables utilised in the study.

The sixth chapter presented and discussed the results of the inferential statistics and interpreted the study's results in relation to the literature review. Inferential statistics were explored to comprehensively understand the variables influencing the working conditions of women employed in mining operations at the mining company under investigation.

The seventh chapter presented the principal conclusions and recommendations in relation to the study's stated research objectives. Furthermore, the chapter provided research recommendations for future investigations.

This study elucidates critical results on women in mining, providing significant insights for stakeholders in South Africa. The results underscore the necessity for informed policy-making and resource allocation, particularly for governmental entities, non-governmental organisations and educational institutions addressing these challenges. Utilising these insights would enable stakeholders to develop strategies that promote gender equity, enhance community well-being and foster sustainable development. Furthermore, the study emphasised the importance of collaboration among researchers, policymakers and practitioners to transform results into actionable strategies that align with South African mining industry needs. This research may be a valuable resource for stakeholders committed to advancing the nation's socioeconomic landscape.

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ANNEXURE A: ETHICS APPROVAL

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Senate Committee for Research Ethics
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30 November 2021

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Basic and Social Sciences Research Ethics Committee (BaSSREC)** on 30/11//2021, the Basic and Social Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-SERC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: "An exploration of the working conditions of women employed in mining operations at a platinum mine in South Africa".

Study Leader/Supervisor (Principal Investigator)/Researcher: Dr D Botha

Student/Research Team: G. Noge (25976303)

Ethics number:

N	W	U	-	0	0	6	5	1	-	2	1	-	A	7
Institution				Study Number						Year			Status	

Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type: Single Study

Commencement date: 30/11/2021 **Risk:** Low

Expiry date: 30/11/2022

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- *The study leader/supervisor (principle investigator)/researcher must report in the prescribed format to the BaSSREC:*
  - *annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and*
  - *without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.*
- *The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the BaSSREC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.*
- *Annually a number of studies may be randomly selected for an external audit.*
- *The date of approval indicates the first date that the study may be started.*
- *In the interest of ethical responsibility, the NWU-SCRE and BaSSREC reserves the right to:*

- *request access to any information or data at any time during the course or after completion of the study;*
- *to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;*
- *withdraw or postpone approval if:*
  - *any unethical principles or practices of the study are revealed or suspected;*
  - *it becomes apparent that any relevant information was withheld from the BaSSREC or that information has been false or misrepresented;*
  - *submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or*
  - *new institutional rules, national legislation or international conventions deem it necessary.*

- *BaSSREC can be contacted for further information or any report templates via 21081719@nwu.ac.za / 13128388@nwu.ac.za.*

The BaSSREC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the BaSSREC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely

Prof Jacques Rothmann

Chairperson NWU Basic and Social Sciences Research Ethics Committee

Original details: (22351930) C:\Users\22351930\Desktop\ETHICS APPROVAL LETTER OF STUDY.docm
8 November 2018

File reference: 9.1.5.4.2

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05 April 2024

APPROVAL FOR CONTINUATION OF THE RESEARCH STUDY

Ethics number: NWU-00651-21-A7
Study title: An exploration of the working conditions of women employed in mining operations at a platinum mine in South Africa.
Study leader/supervisor: Prof. D. Botha
Student: G.G. Noge (25976303)
Application type: Single study
Risk level: Low risk

Dear Researcher

You are kindly informed that this application was reviewed for monitoring at the meeting of the North-West University Basic and Social Science Research Ethics Committee (BaSSREC), Faculty of Humanities, North-West University, held on **03/04/2024**. Following the review of the application, it has been decided that the study is approved for continuation.

Suspension	
Continuation	**X**
Termination	

Approval date: 03/04/2024
Expiry date: 03/04/2025

If you have any questions or need further assistance, please contact BaSSREC.

Yours sincerely

Professor Erhabor Idemudia Chairperson: NWU-BaSSREC

ANNEXURE B: INFORMED CONSENT FORM AND QUESTIONNAIRE

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

You are invited to participate in a research study titled **An exploration of the working conditions of women employed in mining operations at a platinum mine in South Africa**. This study will be conducted by Geraldine Noge.

Please take some time to read the information presented here, which explains the details of this study. Please ask the researcher any questions about any part of this study that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research is about and how you could be involved.

This study has been approved by the Basic Social Sciences Research Ethics Committee of the Faculty of Humanities of North-West University (NWU-00651-21-A7) and will be conducted according to the ethical guidelines and principles of the international Singapore Statement on Research Integrity (2010) and the ethical guidelines of the National Health Research Ethics Council. It might be necessary for the Research Ethics Committee members or relevant authorities to inspect the research records to make sure that the researcher is conducting research in an ethical manner.

What is this research study all about?

The aim of this research is to explore the working conditions of women employed in mining operations at a platinum mine in South Africa.

Who will be taking part in the study?

If you are a woman working in mining operations underground or on the surface of the mining organisation, you are eligible to participate in the study. This will include, but is not limited to, women who are employed in mining, engineering, geology, chemistry, mine surveying, health and safety, technology and laboratories and in supervisory or management roles. Women employed in administrative and supportive positions such as clerical, secretarial, catering, education, human resource, nursing and health work will be excluded from the survey. No one will be excluded based on age or ethnicity. To be able to complete the questionnaire, participants should have English language proficiency skills of Grade 10 or above.

Do I have to participate?

Your participation is entirely voluntary, and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you agreed to take part. Prior to publication of the study's results (or the point where publication is in process), you may also withdraw the data you generated.

How will the data be collected?

A hardcopy questionnaire will be used to obtain information. It will take approximately 20 to 30 minutes of your time to complete.

Are there risks involved in your taking part in this research and how will these be managed?

This study has been classified as minimum risk and you are only asked to provide about 20 to 30 minutes of your time to complete the electronic survey. If you experience any discomfort, you can skip a question you do not want to answer or do not feel comfortable to answer. You can withdraw from the study at any time. Furthermore, the information provided by you in this questionnaire will not be used in any manner that would allow identification of your individual responses. The findings will be reported anonymously as group findings and not as individual findings. The data gathered will be captured in a database, will be statistically analysed and will be used for research purposes.

What will happen to the data?

The data will be analysed and written up by the researcher for submission to accredited scientific journals for publication. These publications will be available on the University's repository in the library catalogue and online on the respective publishers' sites.

Who can I contact for more information or to ask questions?

Should you require any further information about any aspect of this study and/or want feedback on the study, please contact Geraldine Noge at 25976303@nwu.ac.za or 071 316 2794.

INFORMED CONSENT

- I understand the purpose and nature of this study and I am participating voluntarily.
- I understand that I can withdraw from the study at any time, without any penalty or consequences.
- I agree that the information that I provided may be used for research purposes.

I agree	
I do not agree	

Thank you for agreeing to participate in this survey.

A. BIOGRAPHICAL INFORMATION

1. What is your age in years?

1.1	19 and younger	1
1.2	20–29	2
1.3	30–39	3
1.4	40–49	4
1.5	50–59	5
1.6	60 and older	6

2. With which racial group do you identify yourself?

2.1	Black African	1
2.2	White	2
2.3	Indian/Asian	3
2.4	Coloured	4
2.5	Other	5
2.6	Prefer not to answer	6

3. What is your marital status?

3.1	Single and not in a relationship	1
3.2	Unmarried and in a relationship	2
3.3	Widowed	3
3.4	Married/Remarried	4
3.5	Divorced/Separated	5
3.6	Prefer not to say	6

4. How many children do you have?

4.1	None	1
4.2	One	2
4.3	Two	3
4.4	Three	4
4.5	Four	5
4.6	Five	6
4.7	More than five	7

5. What is your highest qualification?

5.1	Less than high (secondary) school	1
5.2	Completed some high (secondary) school	2
5.3	High (secondary) school graduate	3
5.4	Completed some college education	4
5.5	Undergone technical/vocational training	5
5.6	College/University degree	6
5.7	Completed some postgraduate work	7
5.8	Postgraduate degree	8
5.9	PhD	9

6. Where do you work at the mine?

6.1	Underground	1
6.2	On the surface	2
6.3	Underground and on the surface	3

7. Are you required to work night shifts?

7.1	Yes	1
7.2	No	2

8. How long have you been working in the mining environment?

8.1	0–6 months	1
8.2	7–12 months	2
8.3	1–2 years	3
8.4	3–5 years	4
8.5	6–10 years	5
8.6	11–20 years	6
8.7	More than 20 years	7

9. What is your level of employment at the mine?

9.1	Unskilled worker	1
9.2	Semi-skilled worker	2
9.3	Skilled worker	3
9.4	Junior management	4
9.5	Middle management	5
9.6	Senior management (Exco) level	6
9.7	Executive management (Board) level	7

10. What is your PRIMARY role at the mine (e.g. mining engineer, electrician, etc.)?

11. Give the PRIMARY reason why you selected a career in mining.

11.1	Close to home	1
11.2	Unemployment	2
11.3	Difficult to get another job	3
11.4	Job security	4
11.5	Bursary	5
11.6	Exciting work environment	6
11.7	Challenging industry	7
11.8	Ability to apply skills	8
11.9	Competitive pay and benefits	9
11.10	Opportunities for advancement	10
11.11	International work opportunities	11
11.12	Other	12

If other, please specify:

12. Are you part of any work committees in your organisation, for example a Women in Mining Forum, Transformation Committee, Gender Equity Committee, Health and Safety Committee, Skills Development Committee, etc.?

12.1	Yes	1
12.2	No	2

If yes, please specify.

B. COMPANY BENEFITS

1. Does your mining organisation provide the following benefits to employees?

No.	Benefit	Yes	No
1.1	Performance bonus	1	2
1.2	Housing	1	2
1.3	Medical aid	1	2
1.4	Travelling/Transport allowance	1	2
1.5	Cell phone allowance	1	2
1.6	Shift allowance	1	2
1.7	Remoteness leave	1	2
1.8	Training opportunities	1	2
1.9	Bursary/Scholarship	1	2
1.10	Bursary/Scholarship for employees' dependants	1	2
1.11	Study leave	1	2
1.12	Maternity benefits	1	2
1.13	Alternative employment for pregnant women	1	2
1.14	Day shift work for women with babies	1	2
1.15	Day childcare	1	2
1.16	Pension plan	1	2
1.17	Life insurance	1	2
1.18	Dental care	1	2
1.19	Other	1	2

If other, please specify:

C. COMPANY POLICIES

1. Does the mining organisation have the following gender-sensitive policies in place?

No.	Gender-sensitive policy	Yes	No	Don't know
1.1	Employment equity policy	1	2	3
1.2	Skills development policy	1	2	3
1.3	Maternity policy	1	2	3
1.4	Sexual harassment policy	1	2	3
1.5	Gender-based health and safety policy	1	2	3
1.6	Leave policy (including categories of leave such as annual leave, family responsibility leave, study leave, special circumstances/emergency leave)	1	2	3
1.7	Other	1	2	3

D. DEVELOPMENT OPPORTUNITIES

1. Comment on each of the following statements regarding personal development opportunities offered by the mining organisation to women by choosing the appropriate option.

No.	Statement	Not at all	Rarely	Sometimes	Often	Almost always
		1	**2**	**3**	**4**	**5**
1.1	Provision is made for the career development of women (e.g. career paths, individual development plans, mentorship plans, financial resources).	1	2	3	4	5
1.2	Supportive practices are in place to assist women with career development needs (e.g. career counselling, senior leadership, mentoring).	1	2	3	4	5
1.3	Financial support is provided to women for career development (e.g. sponsorships, bursaries, loans, travel and accommodation costs to attend conferences).	1	2	3	4	5
1.4	Specialised skills development training opportunities are provided to women (e.g. welding and boiler-making courses).	1	2	3	4	5
1.5	Communication is provided about training opportunities to women.	1	2	3	4	5
1.6	Flexibility is offered in terms of the time and location of training to make it accessible to women.	1	2	3	4	5
1.7	The training programmes help to increase women's chances of promotion (e.g. transferral from a lower-level job to a higher-level job).	1	2	3	4	5
1.8	Specialised on-the-job training is provided to enable women to move into more technical areas of work.	1	2	3	4	5
1.9	Effective mentorship programmes for women are provided.	1	2	3	4	5
1.10	Opportunities for women to network and advance their careers are offered (e.g. women in mining events, exposure to women in mining associations).	1	2	3	4	5
1.11	Structured leadership development programmes to enable women to enter senior leadership positions are offered.	1	2	3	4	5

2. Does the mining organisation provide the following study assistance schemes to women?

No.	Study assistance scheme	Yes	No	Don't know
2.1	Bursaries	1	2	3
2.2	Study loans	1	2	3
2.3	Skills development funds	1	2	3
2.4	Sponsored scholarships	1	2	3
2.5	Sponsored mining courses	1	2	3
2.6	Opportunities to obtain formal qualifications at institutions of higher education	1	2	3
2.7	Other	1	2	3

If other, please specify:

E. INFRASTRUCTURE FACILITIES

1. Comment on each of the following statements regarding infrastructure facilities provided by the mining organisation <u>ON THE SURFACE</u> by choosing the appropriate option.

No.	Statement	Not at all	To some extent	To a moderate extent	To a great extent	Don' t know
		1	**2**	**3**	**4**	**5**
1.1	Adequate TOILET facilities to accommodate the number of women using them are provided.	1	2	3	4	5
1.2	Adequate CHANGING facilities to accommodate the number of women using them are provided.	1	2	3	4	5
1.3	Hygienic TOILET facilities for women are provided.	1	2	3	4	5
1.4	Hygienic CHANGING facilities for women are provided.	1	2	3	4	5
1.5	Showers are equipped with curtains or doors.	1	2	3	4	5
1.6	Change rooms are provided with sufficient lockers to accommodate the number of women using them.	1	2	3	4	5
1.7	Separate toilet facilities are provided for women and men.	1	2	3	4	5
1.8	The TOILET facilities have adequate sanitary bins.	1	2	3	4	5
1.9	The TOILET facilities have adequate hand-washing facilities (e.g. washbasin and hand wash detergent).	1	2	3	4	5
1.10	The TOILET facilities are located within a reasonable distance from the working place.	1	2	3	4	5
1.11	The TOILET facilities have adequate lighting facilities.	1	2	3	4	5
1.12	The CHANGING facilities have adequate sanitary bins.	1	2	3	4	5
1.13	The CHANGING facilities have adequate hand-washing facilities (e.g. washbasin and hand wash detergent).	1	2	3	4	5
1.14	Adequate accommodation is provided for female miners (e.g. family units).	1	2	3	4	5
1.15	Adequate transport services to and from the mine are provided.	1	2	3	4	5
1.16	Decent childcare facilities to accommodate women with children are provided.	1	2	3	4	5
1.17	Adequate breastfeeding facilities for women are provided.	1	2	3	4	5

2. Comment on each of the following statements regarding toilet facilities provided by the mining organisation <u>UNDERGROUND</u> by choosing the appropriate option.

No.	Statement	Not at all	To some extent	To a moderate extent	To a great extent	Don' t know
		1	**2**	**3**	**4**	**5**
2.1	Separate toilet facilities are provided for women and men underground.	1	2	3	4	5
2.2	Hygienic toilet facilities are provided underground.	1	2	3	4	5
2.3	The toilet facilities underground have sanitary bins.	1	2	3	4	5
2.4	The toilet facilities underground have hand-washing facilities (e.g. washbasin and hand wash detergent).	1	2	3	4	5
2.5	Toilet facilities underground are regularly cleaned.	1	2	3	4	5
2.6	The toilet facilities underground are located within a reasonable distance from the working place.	1	2	3	4	5
2.7	The toilet facilities underground have adequate lighting facilities.	1	2	3	4	5
2.8	The toilet facilities underground have a locking device for privacy.	1	2	3	4	5

3. Does the mining organisation provide the following housing facilities?

No.	Housing facility	Yes	No	Don't know
3.1	Family units	1	2	3
3.2	Hostels for men	1	2	3
3.3	Hostels for women	1	2	3
3.4	Home ownership options	1	2	3
3.5	Living-out allowance	1	2	3
3.6	Other	1	2	3

If other, please specify:

4. Does the mining organisation provide the following childcare facilities?

	Childcare facility	Yes	No	Don't know
4.1	On-site day childcare facilities	1	2	3
4.2	On-site 24-hour childcare facilities	1	2	3
4.3	Day childcare facilities elsewhere	1	2	3
4.4	24-hour childcare facilities elsewhere	1	2	3
4.5	Other	1	2	3

If other, please specify:

F. PHYSICAL PROFICIENCY ABILITIES

1. Comment on each of the following statements regarding the APPOINTMENT OF WOMEN IN MINING OPERATIONS (e.g. mining, metallurgy, engineering) at your mining organisation by choosing the appropriate option.

No.	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	**2**	**3**	**4**	**5**
1.1	Women are only appointed in mining operations positions if they have the required physical and functional capabilities.	1	2	3	4	5
1.2	Women are only appointed in positions that require physical strength and endurance if they are declared medically fit.	1	2	3	4	5
1.3	Women's size and body build are considered when appointing them in core mining positions.	1	2	3	4	5
1.4	Women are often appointed in positions without having the physical capability to cope with the requirements of the position.	1	2	3	4	5
1.5	Male employees often have to assist women if they are unable to cope with the requirements of their positions.	1	2	3	4	5
1.6	Male employees often become annoyed when they have to assist women when they lack physical strength.	1	2	3	4	5

2. Comment on each of the following statements regarding women's PHYSICAL CAPABILITY by choosing the appropriate option.

No.	Statement	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
		1	**2**	**3**	**4**	**5**
2.1	Certain employment positions are not well suited for women.	1	2	3	4	5
2.2	Some mining tasks can only be done by men.	1	2	3	4	5
2.3	Women have the capability to operate a locomotive.	1	2	3	4	5
2.4	Women have the capability to operate a winding engine.	1	2	3	4	5
2.5	Women have the capability to operate a load haul dump machine.	1	2	3	4	5
2.6	Women have the capability to operate a rubber dozer.	1	2	3	4	5
2.7	Women have the capability to operate a conveyer belt.	1	2	3	4	5
2.8	Women have the capability to operate heavy and/or vibrating power tools, e.g. a rock drill.	1	2	3	4	5
2.9	Women have the capability to operate a winch.	1	2	3	4	5
2.10	Women have the capability to operate a shift.	1	2	3	4	5
2.11	Women experience more physiological strain than men when performing mining tasks.	1	2	3	4	5
2.12	Women experience physiological strain when performing physically demanding tasks for an extended period.	1	2	3	4	5
2.13	Labour-intensive work is tough on women's bodies (e.g. results in fatigue and body pain).	1	2	3	4	5
2.14	Labour-intensive work results in menstrual cycle issues (e.g. delayed ovulation and longer cycles).	1	2	3	4	5
2.15	The inclusion of women in a mining team has a negative impact on productivity.	1	2	3	4	5

3. Does your mining organisation undertake the following pre-employment medical examinations?

No.	Pre-employment medical examination	Yes	No	Don't know
3.1	Written questionnaire about your medical history	1	2	3
3.2	Standard physical assessments (e.g. testing hearing, lung function, eyes, blood pressure, joint range of motion)	1	2	3
3.3	Physical fitness test (e.g. running on a treadmill, riding an exercise bike, performing a step-aerobics test)	1	2	3
3.4	Heat tolerance screening	1	2	3

4. Are there specific equipment and tools in the workplace that are banned for women at your mining organisation?

Yes	No	Unsure
1	2	3

If yes, please specify the equipment and tools:

5. Are there work units at your mining organisation that are banned for women?

Yes	No	Unsure
1	2	3

If yes, please specify the work units:

G. HEALTH AND SAFETY CONSIDERATIONS

1. Comment on each of the following statements regarding women's health and safety in the workplace by choosing the appropriate option.

No.	Statement	Not at all	Rarely	Sometimes	Often	Almost always
		1	**2**	**3**	**4**	**5**
1.1	Women are supplied with information about the hazards and risks to their health and safety.	1	2	3	4	5
1.2	Women are supplied with information about the measures taken to eliminate or minimise these hazards and risks.	1	2	3	4	5
1.3	All necessary measures are taken to ensure women's personal safety in the CAGES/LIFTS (e.g. limiting the number of people transported in cages/lifts).	1	2	3	4	5
1.4	All necessary measures are taken to ensure women's personal safety UNDERGROUND (e.g. separate toilet facilities for women and men).	1	2	3	4	5
1.5	All necessary measures are taken to ensure women's personal safety in TOILET AND CHANGING FACILITIES (e.g. adequate lighting, locking devices).	1	2	3	4	5

No.	Statement	Not at all	Rarely	Sometimes	Often	Almost always
		1	**2**	**3**	**4**	**5**
1.6	All necessary security measures are taken to ensure women's personal safety when working night shift (e.g. security services).	1	2	3	4	5
1.7	Adequate company transport is provided at work to ensure women's safety when working night shifts.	1	2	3	4	5
1.8	Adequate lighting facilities are provided to enhance safety for female users when working night shifts.	1	2	3	4	5
1.9	The personal protective equipment provided accommodates women's unique body structure.	1	2	3	4	5
1.10	The personal protective equipment provided makes sufficient provision for pregnant women (e.g. maternity overalls).	1	2	3	4	5
1.11	The personal protective equipment provided is designed to ensure a comfortable fit.	1	2	3	4	5
1.12	The personal protective equipment provided assists women to perform their duties safely and efficiently.	1	2	3	4	5
1.13	Adequate information is provided to women on how to use personal protective equipment correctly and effectively.	1	2	3	4	5
1.14	Women are regularly educated on the maintenance and inspection of their own personal protective equipment.	1	2	3	4	5
1.15	All necessary measures are taken to control the risk of dust exposure of workers (e.g. water sprays, fit-for-purpose protective equipment).	1	2	3	4	5
1.16	Awareness is created among women regarding the risks in terms of the handling of mining equipment and tools.	1	2	3	4	5
1.17	Women are educated on the correct methods for handling or moving heavy mining equipment and tools.	1	2	3	4	5
1.18	Pregnant women are provided with alternative employment where they are not exposed to hazardous or dangerous conditions.	1	2	3	4	5
1.19	Alternative employment is provided for women during early motherhood and breastfeeding.	1	2	3	4	5
1.20	The mining organisation is actively involved in HIV/AIDS awareness programmes.	1	2	3	4	5
1.21	The mining organisation works to mitigate and combat HIV/AIDS in the mining industry.	1	2	3	4	5
1.22	Provision for rehabilitation is made in the case of accidents at work.	1	2	3	4	5
1.23	Training and support programmes are provided to women focusing on coping mechanisms for non-work-related demands (e.g. balancing work–life and home–life).	1	2	3	4	5

2. Comment on how comfortable each of the following personal protective equipment fit by choosing the appropriate option.

No.	Personal protective equipment	Not at all	To some extent	To a moderate extent	To a great extent	Don't know
		1	**2**	**3**	**4**	**5**
2.1	Hard hats/Helmets	1	2	3	4	5
2.2	Gloves	1	2	3	4	5
2.3	Ear plugs	1	2	3	4	5
2.4	Ear muffs	1	2	3	4	5
2.5	Safety shoes/boots	1	2	3	4	5
2.6	Gumboots	1	2	3	4	5
2.7	Gaiters and foot guards	1	2	3	4	5
2.8	Knee guards	1	2	3	4	5
2.9	Socks	1	2	3	4	5
2.10	Reflective vests	1	2	3	4	5
2.11	Dust/Gas masks	1	2	3	4	5
2.12	Safety glasses/spectacles/visors	1	2	3	4	5
2.13	Overalls (one-piece)	1	2	3	4	5
2.14	Overalls (jacket and pants)	1	2	3	4	5

H. WORKPLACE PRACTICES

1. Comment on each of the following statements regarding workplace practices by choosing the appropriate option.

No.	Statement	Not at all	To some extent	To a moderate extent	To a great extent	Don't know
		1	**2**	**3**	**4**	**5**
1.1	Men and women are treated FAIRLY in the workplace (e.g. in terms of promotions and development opportunities).	1	2	3	4	5
1.2	Men and women are treated EQUALLY in the workplace (e.g. in terms of promotions and development opportunities).	1	2	3	4	5
1.3	Leadership supports the acquisition of new skills irrespective of gender.	1	2	3	4	5
1.4	Female employees are accepted by their MALE CO-WORKERS.	1	2	3	4	5
1.5	Female employees are accepted by mining WORK TEAMS.	1	2	3	4	5
1.6	Stereotypes such as 'mining is not a place for women' are still present.	1	2	3	4	5
1.7	Women are underestimated by male co-workers (e.g. in terms of their skills and capabilities to lead and manage).	1	2	3	4	5
1.8	Men do not readily take instructions from female employees.	1	2	3	4	5
1.9	Men treat women disrespectfully in the workplace.	1	2	3	4	5
1.10	The mining organisation values gender diversity.	1	2	3	4	5
1.11	Women's inputs are appreciated in the organisation.	1	2	3	4	5

No.	Statement	Not at all	To some extent	To a moderate extent	To a great extent	Don' t know
		1	**2**	**3**	**4**	**5**
1.12	Women are involved in decision-making processes.	1	2	3	4	5
1.13	Women feel isolated in work teams.	1	2	3	4	5
1.14	Sex in the workplace in exchange for favours is commonly practised in the mining organisation.	1	2	3	4	5
1.15	Sexual harassment is a problem in the workplace (e.g. threats, demands, bodily contact).	1	2	3	4	5
1.16	Regular awareness campaigns for sexual harassment are provided.	1	2	3	4	5
1.17	Regular training is provided on the procedures to follow if sexual harassment occurs.	1	2	3	4	5
1.18	Sexual harassment complaints are effectively investigated.	1	2	3	4	5
1.19	Pregnant women are treated well from the moment they disclose their pregnancy (e.g. employment in alternative positions requiring light duty).	1	2	3	4	5
1.20	The mining organisation has an effective channel for women to voice their concerns to management (e.g. the Women in Mining Forum).	1	2	3	4	5
1.21	Trade unions are essential for improving conditions for women at the mining organisation.	1	2	3	4	5
1.22	Management effectively responds to women's concerns in the organisation.	1	2	3	4	5

I. PERSONAL

1. Comment on the influence that your work at the mining organisation has on each of the following by choosing the appropriate option.

No.	Statement	Negative influence	No influence	Positive influence	Not applicable
		1	**2**	**3**	**4**
1.1	Childcare responsibilities	1	2	3	4
1.2	Children's developmental problems	1	2	3	4
1.3	Marital conflict/Conflict with partner	1	2	3	4
1.4	Community involvement	1	2	3	4
1.5	Health and wellness	1	2	3	4
1.6	Relationship with friends and family	1	2	3	4

2. In your opinion, what are the main challenges that women employed in mining operations (e.g. mining, metallurgy, engineering) encounter in the mining industry?

3. Are there any other concerns that you would like to share?

Thank you for taking the time to complete this survey.

ANNEXURE C: LANGUAGE EDITOR LETTER

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Proof of editing

11 November 2024

This letter serves as proof that the Master of Arts in Industrial Sociology dissertation titled "An exploration of the working conditions of women employed in mining operations at a platinum mine in South Africa" by Gosiame Noge was professionally copy (language) edited. The finalisation of tracked changes and comments inserted remains the responsibility of the student.

Kind regards

LM Bedeker
BA, Postgraduate Diploma (Translation) *cum laude*, MPhil (Translation) *cum laude*
Accredited member of the South African Translators' Institute (accreditation number 1001437)
Full member of the Professional Editors' Guild

ANNEXURE D: STATISTICAL CONSULTATION SERVICES LETTER

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11 November 2024

Re: Thesis, Ms Gosiame Noge, student number 25976303
AN EXPLORATION OF THE WORKING CONDITIONS OF WOMEN EMPLOYED IN MINING OPERATIONS AT A PLATINUM MINE IN SOUTH AFRICA

We hereby confirm that the Statistical Consultation Services of the North-West University analysed the data of the above-mentioned student.

Kind regards

Dr E Fourie
Senior Consultant: Statistical Consultation Services